dysfunction has certain advantages which weigh in its favour compared to other drugs, and mild bradycardia was the commonest finding in this study. However, selecting patients with predictors of non-conversion at the outset for administration of intravenous amiodarone, while observing the remaining and administering amiodarone to those still in fibrillation after 8 h may be a more effective strategy. DC cardioversion could then be considered in those resistant to 24 h of intravenous amiodarone at 125 mg. h⁻¹.

The natural course of paroxysms lasting more than 48 h is, however, undefined and may represent a group with a greater incidence of heart disease as well as lower response rates to pharmacological cardioversions; in such a group (historically identified) as well as those with shorter paroxysms resisting pharmacological cardioversion earlier electrical cardioversion may prevent or reduce electrical remoulding and perhaps the development of persistent atrial fibrillation.

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References

A plea for provisional stenting

See page 1783 for the article to which this Editorial refers

It has been convincingly shown in landmark randomized trials, that primary stenting may reduce the rate of restenosis and major adverse cardiac events in selected patients compared to balloon angioplasty alone[1]. On the other hand it evolved that restenosis after stenting, if it occurs, is more difficult to treat and fraught with a worse prognosis than restenosis after balloon angioplasty. An especially diffuse in-stent restenosis has been termed a ‘malignant’ disease due to a risk of a restenosis rate of >60% and the lack of appropriate interventional strategies to overcome this problem.

As there is clear evidence from several multivariate analyses, that the degree of residual stenosis after balloon angioplasty is the most important predictor of future restenosis, many cardiologists chose to selectively perform stent implantation in patients with suboptimal results after PTCA. This strategy of ‘provisional stenting’ for suboptimal PTCA results is currently the most applied indication for stent implantation. A recent assessment of the opinions of European interventional cardiologists revealed that a suboptimal angiographic result, defined as a residual stenosis after PTCA >30%, is considered an indication for stent placement by 55% of the responding interventionalists[2]. There are, however, little data, supporting such a strategy of a selective use of stents in patients with a suboptimal result following balloon angioplasty. Moreover there is no agreement on a definition of this group of patients.

The study of Knight et al.[3] in this issue is the first prospective trial that randomized patients with suboptimal PTCA results to either stent implantation or no further treatment. In only 11% of the 143 patients was an optimal result (defined as a residual stenosis <15%) obtained. In this group of patients no stent implantation was performed. In 35% of their patients stenting was required due to significant dissection (abrupt or threatened closure) or PTCA failure (residual stenosis >50%). The remaining patients with a suboptimal result (residual stenosis ≥15%, <50%) were randomized. Restenosis occurred in 53% of the patients with a suboptimal result, randomized to PTCA alone, compared to 24% of the patients randomized to stent (P=0.023). The restenosis rate was 14% in patients with an optimal PTCA result and 14% in those who required stent implantation for abrupt or threatened closure.

Subgroup analyses from BENESTENT I and II revealed similar clinical outcomes in stented patients and
patients treated by PTCA that resulted in a less than 30% residual stenosis. Therefore the term ‘stent-like’ PTCA was proposed. In the subgroup of patients with an optimal result after balloon angioplasty (defined as a residual stenosis <30%, normal distal flow and no significant dissection) which is 53% of the BENESTENT II population, repeat target lesion revascularization was needed in 14% of the stent group compared with only 7.8% in the balloon arm with event-free survival of 84% and 80%, respectively ($P<0.01$). Thus, stenting in patients with an optimal result following PTCA did not reduce target lesion revascularization when compared with balloon angioplasty$^4$.

In the OCBAS trial, a strategy of optimal coronary balloon angioplasty with provisional stenting was compared to a strategy of primary stenting$^5$. After randomization, 13.5% of the PTCA group patients crossed over to stent due to early loss within 24 h (provisional stenting). Angiographic restenosis rate at follow-up was 19.2% in the stent vs 16.4% in the PTCA group ($P=ns$). Target lesion revascularization and event-free survival were comparable. A strategy of PTCA with a delayed angiogram and provisional stent if early loss occurs thus yields similar restenosis rates and target vessel revascularization compared to primary stenting after PTCA.

Weaver reported the preliminary results of the Optimal Angioplasty vs Primary Stenting (OPUS Trial) at the ACC meeting$^6$. In the study, a global strategy of primary stenting was compared to a strategy of provisional stenting. Overall, 479 patients (diameter stenosis >70%, lesion length <20 mm, vessel diameter >3.0 mm) were randomized to either routine stenting or balloon angioplasty with provisional stenting. In the primary stent arm 99% of the patients received a stent compared to 37% of the patients in the provisional stent arm. After 6 months, the primary end-point (combined incidence of death, myocardial infarction and target vessel revascularization) was significantly reduced from 14.9% in the provisional stent arm to 6.1% in the primary stent arm ($P=0.003$). The major benefit in the primary stent arm was due to a reduction in the rate of target vessel revascularization (4% vs 10%). There were also fewer deaths (0.4% vs 1.2%), myocardial infarctions 1.7% vs 2.4% and need for coronary artery bypass graft surgery 1.3% vs 3.9%. In contrast to the OCBAS trial, the approach of primary stenting was clearly superior to a strategy of provisional stenting.

With the study of Knight et al.$^3$ there is now accumulative evidence that stenting in patients with suboptimal, but not in patients with optimal (‘stent-like’) results following balloon angioplasty, is associated with an improvement in angiographic restenosis, target lesion revascularization and major cardiac adverse events.

Compared to a strategy of primary stenting, this concept of ‘provisional stenting’ permits selective use of stents in patients at highest risk for restenosis simultaneously avoiding an unnecessary high rate of in-stent restenosis. Moreover one should bear in mind that restenosis after balloon angioplasty does not equal restenosis after stent implantation, considering the worse prognosis of the latter. Thus, a lower target lesion revascularization rate, as seen with a strategy of primary stenting compared to a strategy of provisional stenting in the OPUS trial, may not translate into a long-term clinical benefit, due to a higher rate of in-stent restenosis after primary stenting. However, the optimal threshold in terms of residual stenosis for provisional stenting remains to be defined. With a vigorous definition of an optimal PTCA result, as used by Knight et al.$^3$, only a minority of the patients without the need for stenting would be selected, questioning the clinical relevance of this approach. Until more data from prospective trials are available, the definition of an optimal PTCA result, as used in BENESTENT II (residual stenosis <30%, normal distal flow, no significant dissection), may serve as an appropriate guideline to select a sizeable number of patients without need for stent implantation. In any case the decision to proceed with stenting for suboptimal PTCA results should be critically evaluated and the expected benefit has to be balanced against the risk of diffuse in-stent restenosis.

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