PCI in acute left main disease: a paradigm shift or a new reality?

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This commentary refers to ‘Unprotected left main revascularization in patients with acute coronary syndromes’, by G. Montalescot et al., on page 2308

In the last decade, percutaneous coronary intervention (PCI) has become the treatment of choice for patients with acute coronary syndrome (ACS) in most industrialized countries. As the benefit of acute PCI increases with decreasing delay to vessel revascularization, major efforts have been focused in optimizing each step in patient care. This includes raised awareness in the general population, well-organized alarm systems, rapid and safe patient transportation, pre-hospital patient care, and centralization of acute PCI facilities in high-volume centres. These optimized strategies have resulted in a continuous decrease in mortality over the last few years (Figure 1). In fact, in-hospital mortality after acute PCI in ACS today is as low as <5%. The introduction of new anti-thrombotics and the increasing use of drug-eluting stents have the potential to improve the outcome of ACS patients further.

In addition, elective revascularization of left main disease exhibited very promising results in recent trials. In the subgroup of patients with relevant left main disease of the recently published SYNTAX trial, rates for major adverse cardiac or cerebrovascular events were similar in patients treated with PCI and coronary artery bypass graft (CABG) (15.9 and 13.7%, respectively). However, left main stenting has been carried out with increasing frequency during the last years. Nevertheless, patients with unprotected left main disease still represent a challenge for the interventionalist, especially in the setting of an ACS.

Montalescot et al. have reported the results of patients with ACS and left main disease included in the Global Registry of Acute Coronary Events (GRACE) between 2000 and 2007. From a total of 43,018 patients, 1799 patients (4%) with relevant left main disease were treated by either PCI alone (n = 514), CABG alone (n = 612), or no revascularization (n = 673). Over time, a trend towards more PCI and less CABG was observed.

Several pieces of important information can be derived from this study. First of all, unprotected left main disease in patients with ACS is associated with a high mortality, especially in patients presenting with ST-segment elevation myocardial infarction (STEMI) and/or haemodynamic instability. Overall in-hospital mortality was 7.7%, but reached 11% in patients who presented with STEMI or new left bundle branch block (LBBB), and was as high as 34% in patients with cardiogenic shock or cardiac arrest. For comparison, in the recently published Expanded GRACE registry, in-hospital mortality was 3.7%. The second important piece of information is that in patients not requiring immediate revascularization, a postponed surgical revascularization (during the same hospitalization) provides the best short- and long-term outcome. Patients treated with CABG had an in-hospital mortality of 5.4%, which favourably compared with patients treated conservatively (7.6%) or by PCI (11%). As this is a register and not a randomized trial, we cannot conclude that one or the other revascularization strategies provides better outcome. Patients treated with acute PCI did indeed present more often as STEMI, new LBBB, or cardiogenic shock. Thus, patients treated with PCI had the highest risk at hospital admission. This explains the high in-hospital mortality in this group, but also the incremental mortality of 5.4% during the next months (i.e. between hospital discharge and 6-months follow-up). The good results seen with CABG are at least in part due to a lower risk for this patient group at admission and a patient selection bias. In fact, median time from admission to operation was 4.5 days. Hence, patients who were initially scheduled for CABG, but died before the operation were assigned to the ‘conservative treatment group’. This selection bias is also important in patients with previous cardiac arrest where the neurological condition often only becomes evident after 1 or 2 days. Nevertheless, the outcome of patients treated with CABG was excellent, with incremental mortality of only 1.6% at 6 months. Patients with initial conservative treatment, on the other hand, exhibited an in-hospital mortality of 7.6%. Although 39% of these patients were scheduled for elective CABG, the mortality rate between hospital discharge and 6-month follow-up was as high as 10%. In fact, it appears that the third and probably most relevant message from this registry is that patients that were revascularized during the event hospitalization showed a better long-term outcome compared with the initial conservative therapy. This
The right coronary artery may shift the treatment preference of the lower risk. For the interventionalist, an ostial or midshaft left angina with subendocardial ischaemia associated with a much devices, whereas a subtotal stenosis may present as unstable genic shock and therefore represents a very high-risk situation. This explains why it is indeed very difficult to conduct a randomized trial in patients with ACS and left main disease. Nevertheless, as demonstrated by the SYNTAX trial, such studies are possible under certain conditions. In patients presenting with ACS, however, only those in haemodynamically stable conditions may be eligible for future trials. Such a study would be important, as suggested by the registry data of Montalescot et al.7

Finally, a concern of this study may be the short follow-up (6 months). Unplanned revascularization due to instant-restenosis and late/very late stent thrombosis may affect the long-term outcome of PCI patients and favour surgical revascularization in the long term. Currently, rates of target lesion revascularization in patients with left main disease receiving a drug-eluting stent range from 0 to 14%.8

In our opinion, this observational study provides new important data that stress the importance of prompt and complete revascularization of patients presenting with ACS and left main coronary artery disease. Further research is required to characterize better those patients which benefit the most from percutaneous or surgical revascularization.

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**References**


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