The study of Nishihira et al in this issue of the Journal analyzes the thrombus composition of a population of 264 patients admitted with ST-segment elevation myocardial infarction (STEMI), referred for primary percutaneous coronary intervention (PCI) within the first 24 h. The authors found that age, previous myocardial infarction (MI), cardiogenic shock and organized thrombus were independent predictors of in-hospital death. Some of these factors have been already related to ominous in-hospital prognosis and recurrence of MI.1–5

Article p 1275

It is known that thrombectomy and direct stenting play 2 important roles in primary angioplasty, being associated with good angiographic and clinical outcomes. In particular, direct stenting subsequent to thrombectomy without any pre- or post-dilation avoids any embolization of the thrombotic material with a low rate of no-reflow.6 In contrast with this common practise, it is surprising to see in the present report a large use of pre- and post-dilation in both groups, with a higher rate of distal embolization and/or slow flow during the PCI in the group of patients who died as compared with the group of survivors (59% vs. 38%), which does not reach statistical significance for the small number of patients analyzed. In addition, this higher rate of slow flow could have provoked larger MI, as indirectly reflected by the higher rate of cardiogenic shock and higher level of troponin T in the group of patients who died. It is of note that left ventricular ejection fraction (LVEF) is not mentioned, although it is a known independent predictor of cardiac death post-acute coronary syndrome.7

Another important limitation is the lack of IIb/IIIa use. Although this is unfortunately not approved for use in Japan, it is well known how the combined use of thrombectomy with abciximab is able to improve not only the coronary flow at the end of the primary PCI, but also the LVEF and the incidence of major cardiac adverse events.8 The lack of IIb/IIIa inhibitor therapy seems to be compensated by a relatively high use of thrombolysis therapy during PCI, which could affect the rate of organized thrombus and was higher in those patients who survived as compared with those who died (20% vs. 6%), although statistical significance is again not reached because of the small sample size.

With regards to the thrombus characteristics, Kramer et al have already shown an association between thrombus age and survival at 3 years after acute MI (AMI), as well as distal...
embolization. In our opinion, it would have been interesting if the authors had performed an analysis of the composition of the thrombus in relation to the duration of ischemia. Silvain et al, for example, have demonstrated that the fibrin content of the thrombus is time-dependent and in particular is greater after 6h as compared with less than 3h. Our group has also recently showed that thrombus older than 6h has a higher content of fibrin, fewer platelets, and less actin and tropomyosin (Figure). Each of these factors could limit the efficacy of thrombus aspiration and therefore explain the bad prognosis of patients admitted late for primary PCI. In an intravascular ultrasound study of patients suffering from PCI, it was observed that some plaque characteristics (i.e. the presence of ultrasound attenuation) were associated with worse myocardial perfusion after primary PCI. In contrast, the current authors did not take into consideration the components of an organized thrombus in relation to the duration of ischemia, but have merged all together in the definition of "organized" thrombus, and so that it is not surprising that they did not find any association between organized thrombus, CK peak, distal embolization and no-reflow phenomenon.

References