1. GENERAL INTRODUCTION AND OUTLINE OF THE THESIS
Introduction and outline of the thesis

This thesis focuses on patients presented with acute chest pain caused by an acute myocardial infarction (AMI). The treatment strategy of patients with an acute myocardial infarction is aimed to achieve reperfusion of the occluded coronary artery in order to salvage the jeopardized myocardium. Nowadays, recanalization of the occluded coronary artery by primary percutaneous intervention is the recommended treatment strategy. To achieve reperfusion a wire to cross the occlusion and an inflatable balloon for mechanical dilatation is used to treat the residual stenosis. To prevent acute complications and restenosis, stents are used in almost all patients.

However, during the arise of the VIAMI-trial most patients in The Netherlands were treated with pharmacological reperfusion therapy, known as fibrinolytic therapy. This therapy targets the fibrin network of the occluding clot. Even today most patients worldwide are still being treated with fibrinolytic therapy because of long distance travelling to the nearest intervention center.

Previous studies have shown that routine percutaneous intervention of the infarct-related coronary artery early after myocardial infarction and initially treated with fibrinolytic therapy, did not result in a clinical benefit. Therefore, it is important to select a subgroup of patients with recent myocardial infarction, who will benefit from percutaneous intervention of the infarct-related artery.

The presence of myocardial viability in the infarct-area early after acute myocardial infarction is associated with an increased risk of new cardiac events like recurrent infarction, angina pectoris and need for coronary interventions (see chapter 2).

We postulated that patients with viability in the infarct-area would benefit from percutaneous intervention early after acute myocardial infarction. Therefore, we initiated the Viability guided angioplasty after acute myocardial infarction trial (VIAMI-trial).

In chapter 2 a meta-analysis is described regarding the prognostic value of viability tested with low dose dobutamine echocardiography early after acute myocardial infarction. The main finding of this meta-analysis is that significantly more ischemic events occur in patients with proven viability early after AMI (not treated with primary PCI), without differences in mortality. This increase in ischemic events parallels a more than twofold increase in revascularization procedures in viable patients.

In chapter 3 we describe the rationale and design of the VIAMI trial. All inclusion and exclusion criteria are described extensively with the definitions of the primary and secondary end points.

Chapter 4 addresses the main results of the VIAMI trial after 1 year follow up. Patients with viability in the infarct-area significantly benefit from an early invasive strategy. Importantly, there were no significant differences between patients treated with or without fibrinolysis. Both patient groups showed the same benefit.
This invasive approach results in a clear reduction in ischemic events and a long-term uneventful clinical course. In the patients without viability, the risk of recurrent ischemia remains low.

In chapter 5 the long-term follow up of patients included in the VIAMI-trial are described. The first year clinical benefit of in-hospital stenting of the infarct-related coronary artery is sustained during long-term follow-up in patients with acute myocardial infarction and proven viability in the infarct-area (median 8 years).

In chapter 6 the results of the echocardiographic follow up are shown. Revascularization in the patients with viability in the early phase after AMI results in a significant improvement in LV function. Without revascularization, these patients experience an increase in LV-volumes but with conservation of LV ejection fraction. The absence of viability results in ventricular dilatation and deterioration of the LV ejection fraction, irrespective of revascularization status. The number of viable segments and revascularization during the follow up period are independent predictors for LV EF improvement, especially in patients with lower EF at baseline.

In chapter 7 a prediction model for myocardial viability with the use of electrocardiographic parameters (admission and discharge) is developed. The number of pathological Q waves, persistent ST-segment elevation with positive or negative T waves on discharge ECG were all strong independent negative predictors for the present of myocardial viability. The developed model for predicting myocardial viability appears useful in clinical practice. Especially in the high and low range scores.

Chapter 8 summarizes the conclusions of this thesis and discusses directions for further research.