Clinical and angiographic outcome of patients with mild coronary lesions treated with balloon angioplasty or coronary stenting. Implications for mechanical plaque sealing


AIMS: To investigate the clinical and angiographic outcome of patients with mild coronary lesions treated with balloon angioplasty or coronary stenting (coronary plaque sealing, i.e. dilatation of angiographically non-significant lesions) compared to moderate and severe stenoses. METHODS AND RESULTS: Patients with chronic stable angina and a single de novo lesion in a native coronary vessel scheduled to undergo percutaneous coronary intervention (PCI) were selected from 14 different studies. Off-line analysis of angiographic outcomes was assessed in all patients using identical and standardised methods of data acquisition, analysis and definitions. Clinical endpoints were adjudicated by independent clinical events committees. All quantitative coronary angiographic (QCA) analyses were performed in the same core laboratory. Stenosis severity prior to PCI was categorised into three groups: <50% diameter stenosis (DS), 50-99%DS and >99%DS. A total of 3812 patients were included in this study; 1484 patients (39%) were successfully treated with balloon angioplasty (BA) only and stented angioplasty was performed in 2328 patients (61%). One-year mortality and rate of non-fatal myocardial infarction (MI) (Kaplan-Meier) did not differ between BA and stented angioplasty for any of the stenosis severity categories. Following BA, the combined event rate (death and non-fatal MI) was 4.8, 4.6 and 0% in the <50, 50-99 and >99%DS categories, respectively. Following stented angioplasty, the combined event rate was 3.1, 4.4 and 4.8% in the same categories. The need for repeat revascularisation corrected for stenosis severity in the Cox proportional-hazards regression model was reduced by 20% after stented angioplasty (hazard ratio (HR) 0.80, 95%CI 0.69-0.93). CONCLUSION: The concept of plaque sealing is appealing from the theoretical point of view. However, with current technology, plaque sealing cannot prevent death and future non-fatal MIs in the long-term because 1-year event rates after PCI of non-significant stenoses remain unacceptably elevated when compared with the estimated 1-year probability of a non-fatal MI in lesions with a <50%DS. Moreover, major adverse cardiac events at 1-year after PCI are not directly related to the degree of pre-procedural stenosis severity.