

Application of Pressure Wire in Coronary Artery Disease

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Both anatomical and physiological assessments are important in the diagnosis and management of coronary artery disease. It has been reported that recently proposed pressure-derived myocardial fractional flow reserve (FFR_{myo}) demonstrates an excellent correlation with anatomical information of coronary artery stenosis estimated by quantitative coronary angiography (QCA) and/or intravascular ultrasound (QCU). Using this index, which is determined by the ratio of the pressure proximal to the stenosis divided by the distal pressure during maximal hyperemia, we can decide the indication and the end-point of coronary intervention. Furthermore, the long term prognosis of the patients with coronary artery disease might be predictive by using this index of FFR_{myo}.

Although the usefulness of the index of FFR_{myo} might be established in chronic angina patients, there are only a few descriptions about the application of coronary pressure measurements in cases with acute myocardial infarction (AMI). Originally, pressure-derived FFR_{myo} should be much more specific to the degree of coronary artery stenosis than velocity-derived coronary flow reserve (CFR) in chronic angina, and microvascular dysfunction might affect on CFR more than FFR_{myo}. However, it would be easily imagine that FFR_{myo} should be high and underestimate % diameter stenosis (%DS) in flow limited condition such as AMI.

In this session, the usefulness of FFR_{myo} in the decision of the end-point of coronary intervention would be presented in chronic angina, and the usefulness of intravascular ultrasound would be demonstrated in the assessment of the mechanism of incomplete improvement of FFR_{myo} in spite of angiographically successful coronary intervention. Furthermore, poor correlation between FFR_{myo} and %DS would be indicated in AMI patients, and the mechanism of this poor correlation would be explained. Finally, the concept of coronary wedge pressure and fraction collateral flow (Q_c/Q_n) would be explained, and the limitation of these concept in AMI would be demonstrated.

Thus, the usefulness and the limitation of the intracoronary pressure measurement would be demonstrated in cases with chronic angina and AMI.