Approach to the Flow Rate Distribution of Coronary Branches in the Calculation of Fractional Flow Reserve

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Abstract: In order to improve the calculation accuracy of computed tomography angiography-derived fractional flow reserve (FFR_{CT}), a mathematical model for setting the patient-specific flow boundary condition was proposed, in which some independent physiological parameters, such as myocardial mass, diastolic blood pressure, heart rate and vessel volume were considered. This model was employed to simulate hemodynamics in sixteen patients with coronary stenosis. The results of FFR_{CT} demonstrated good consistency with invasively measured FFR. The diagnostic accuracy of FFR_{CT} was 85%. The proposed model offers a new approach to improve the accuracy of FFR_{CT}, as well as promotes the clinical application of FFR_{CT}.

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