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Absolute coronary flow measurement by continuous infusion thermodilution: in-vitro evaluation

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Introduction

Direct volumetric coronary blood flow measurement during catheterization has not been possible so far. Derived parameters could be assessed using Doppler probes or thermodilution by bolus injection. In this study, the application of continuous infusion of saline for volumetric flow measurement is assessed.

The method is based on the measurement of the temperatures of the blood and the infused saline, and the mixing temperature distal of the infusion site [1]. The main prerequisite for appropriate calculation of the blood flow is for full mixing of the infusate and the blood to occur.

Materials and methods

The mixing is investigated in a physiologically representative in-vitro model of the coronary circulation (figure 2, [2]), using different over-the-wire infusion catheters (specially designed by Occam, commercially available Boston Scientific Tracker 18), at two infusion rates (15 and 25 ml/min), with coronary flow rates varying between 50 and 250 ml/min.

Conclusion

This model study indicates appropriate application of the continuous infusion method for coronary flow measurement, using the specially designed infusion catheter.

References:
