Pitfalls with Pressure Measurements

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Pitfalls with Pressure Measurements

Equipment in general
Height of the fluid-filled transducer
Equalization
Hyperemia
Drift
Guiding catheter
Side Holes
Whipping
Position of the cursor
Accordion effect
Specific features of the LM
... if you start an FFR programme...
Ideal Setting = Fix setting
To get started swiftly...

1. The interface: Localisation & connexion
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Importance of the Height of the Transducer

Pressure TOO LOW

Pressure TOO HIGH
Importance of the Height of the Transducer

H = 5.3 cm

Mid-Chest Level = 12.4 cm

Anterior surface of the chest wall

Uppermost blood level in the chamber in which pressure is to be measured
Importance of the Height of the Transducer

Pitfalls with Pressure Measurements

Fluid Filled Pressure Transducer
Too high (⇒ Pressure TOO HIGH)

Fluid Filled Pressure Transducer
Too low (⇒ Pressure TOO LOW)
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Equalization of the Pressure Wire and the Guide Catheter
Equalization of the Pressure Wire and the Guide Catheter

P\textsubscript{a}

P\textsubscript{d}

Pitfalls with Pressure Measurements

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Equalization of the Pressure Wire and the Guide Catheter

P Pitfalls with Pressure Measurements

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Equalization of the Pressure Wire and the Guide Catheter

Advantages:
1. Manipulation (pull back)
2. Y connector closed
Introduction of a "thin needle"
Into the valve of the "y" connector

Introduction of a "large needle"
Into the valve of the "y" connector

Pressure wire: Introducer needles
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Drift: identical morphology

Pressure Gradient: different morphology

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Pitfalls with Pressure Measurements

Drift?

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Drift ???

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Drift ???

1 mm Hg = 13.3 mm H$_2$O

RCA Proximal
RCA Distal

1.00 FFR

1.79 CURSOR

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Guide Catheter

8F
3 mm  2.4 mm  64%

7F
3 mm  2.1 mm  49%

6F
3 mm  1.8 mm  36%

Sténose
Guide Catheter

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Guide Catheter

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Side Holes

\[ P_c \neq P_a \]
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Position of the Cursor

IC Papaverine

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Position of the Cursor

IC Papaverine

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Accordion Effect
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... if you start an FFR programme...
False Negative FFR: does it exist?
Your patient has a stenosis and/or chestpain but non-ischemic FFR

Checklist

- exclude insufficient hyperemia → try more or other stimulus
- guiding-related problems → avoid deep engagement, flush vigorously
- other culprit lesion? (same vessel or other vessel)
- diffuse disease → pull back curve
- severe microvascular disease (rarely affecting FFR significantly)
- abundant collaterals
- small perfusion territory, old infarction, little viable tissue
- stenosis truly less severe than it looks and functionally non-significant
- chestpain atypical, non-cardiac or not due to the interrogated lesion

- exercise-induced spasm
- severe LVH?
- truly “false negative FFR” (very rare)
If you intend to start an FFR programme...

1. Train your nursing staff and techs and explain why you do it
2. Identify key personnel to educate the others... (FFR champions)
3. Do it the same way every time
4. Start with a series of tight lesions... (easier to understand)
5. Be consistent in your decisions... (if not, don’t do it)
6. Be modest (pressure never lies)...
7. If you ever think of doing, just do it
FFR is like Instrument Flying

Courtesy of Peter Verlee, MD, Bangor, Maine
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