COMET: advancing the use of physiology in PCI, from routine to complex cases

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Disclosure Statement

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below.

Affiliation/Financial Relationship
• Grant/Research Support
• Consulting Fees/Honoraria

Company
• Boston Scientific
• Abbott Vascular
• Boston Scientific
Learning Goals of this Session

• To recognise how an optical sensor pressure wire may advance treatment options in complex patients

• To understand the importance of physiological assessment to guide PCI strategy
  – RIPCORD II (Prof N Curzen)
  – SYNTAX II (Dr N Gonzalo)

• To discuss the optimal timing of treating non-culprit lesions
  – FULL REVASC (Dr F Bohm)
Comet Wire (Fibre-optic sensor)

- **Spring Coil**
- **Ultrathin Hydrophobic Silicone Coating**
- **ACTONE**
- **Stainless Steel Core**
- **Ultrathin Hydrophilic Coating**

- **Optical fiber**
- **Laser cut spiral stainless steel**
- **Larger diameter Nitinol core – enhanced torque characteristic**
Bench Performance

Guidewire 1:1 Torque

Degrees of Wire Rotation

Degrees of Motor Input Rotation

- Motor Pos
- St. Jude
- Volcano
- BSC FFR
Diastolic Pressure Ratio (dPR): New Approach and Validation versus the Instantaneous Wave-Free Ratio (iFR)

A pooled sub-study of diagnostic performance from VERIFY 2 and CONTRAST

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Recent work on alternative diastolic pressure ratios (dPR) has shown numerical equivalency to iFR using multiple different diastolic time periods based on the dicrotic notch.

iFR proposed the “wave-free” period (WFP) of diastole utilizing the ECG signal for its original implementation.

Resistance during the WFP was later shown to be higher than during whole-cycle hyperemia.
BSCI Diastolic Pressure Ratio (dPR)

- dPR window samples Pd/Pa when: \( \text{Pa} < \text{mean Pa AND down-sloping Pa} \)
- Does not require ECG signal
- No need to identify dicrotic notch
- Averages over 5 beats
VERIFY 2 + CONTRAST Pooled Analysis

$dPR$ scatter plot

Accuracy = 98%
Sensitivity = 96%
Specificity = 99%

$N = 893$ lesions
$r^2 = 0.993$, AUC 0.997