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Optical Coherent Reflectometry(OCR): A New Technique to Guide Invasive Procedures

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A prototype system using optical coherent reflectometry(OCR) was developed and tested in human femoral arteries in vitro. OCR uses the interference of reflected light(wave length 1300nm) to distinguish plaque from media. Based on the characteristics of the relative intensity of reflected light, OCR has an inherent resolution of 10 microns that can be used to measure the distance from the catheter tip through the plaque to the media surface. This system potentially could be used to guide devices during recanalization of completely occluded arteries. A stiff guide wire OCR system(0.014" diameter) was passed through 6 artery segments. Twenty-eight passages were performed and the designation of plaque or non-plaque(media or adventitia: M/A) was compared to the position of the tip of the guide wire as documented by intravascular ultrasound(I-VUS: HP Sonicath 30MHz). IVUS and OCR correlated in 21 of 28 measurements (75%). Sensitivity and specificity of OCR were 79% and 89%, respectively (p <0.001). In conclusion, this preliminary data suggests that OCR may be a useful means of guiding interventional devices to help steer through chronic total occlusions.

	OCR		Total
(n=28) **IVUS**	Plaque	M/A	
Plaque	15(79%)	4(21%)	19
M/A	1(11%)	8(89%)	9

M/A=Media or adventitia