



The TOP 3 Take Home Messages from the

**Bifurcation Stenting Guidance :
OCT, IVUS, FFR & Angio**

Parallel Session



Bifurcation Stenting Guidance : OCT, IVUS, FFR & Angio

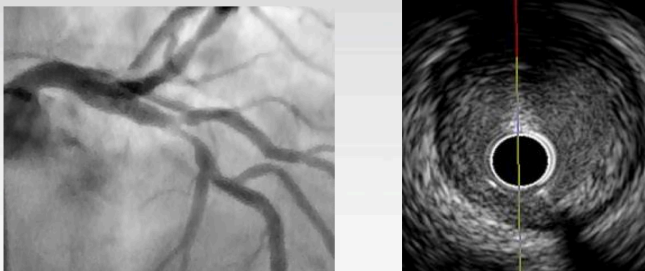
- **Side Branch compromise** predicted by OCT, Uemura
- New implications of optimal **SB re-crossing**, Onuma
- **Acute malapposition** and delayed strut coverage, Foin
- **Post-Stent Strut apposition** and FU strut coverage assessed by OCT analysis, J-S Kim
- Importance of **routine use of OCT** in bifurcation treatment, Murasato
- Why I prefer **IVUS** in bifurcation guidance, Yamawaki
- **Side Branch evaluation** by OCT, DOCTOR left main, Holm
- OCT guided **BVS implantation** in bifurcations, Motreff
- OCT in assessment of **stent failure at the bifurcation level** (ST, ISR), Adriaenssens

Bifurcation Stenting Guidance : OCT, IVUS, FFR & Angio

Message n°1

- **We need intracoronary imaging in Bifurcation management**
 - Angiography alone is not enough
 - Suboptimal results are underestimated
 - OCT or IVUS ?

Why I prefer IVUS in bifurcation guidance



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On behalf of J-REVERSE Investigators

Conclusion

Why I prefer IVUS in bifurcation guidance

Because we can check optimal result after stenting by IVUS.

In addition, IVUS before- and during PCI helps us to

- (1) know precise anatomy, and predict SB compromise as well as luminal widening after FKI.
- (2) make your final strategy of bifurcation-PCI
- (3) make your procedure logical and predictable !

Dr Yamawaki



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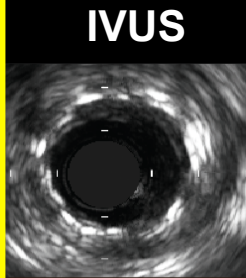
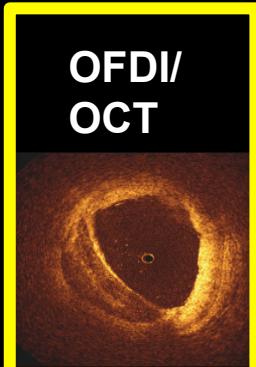
Bifurcation Stenting Guidance : OCT, IVUS, FFR & Angio

Message n°2

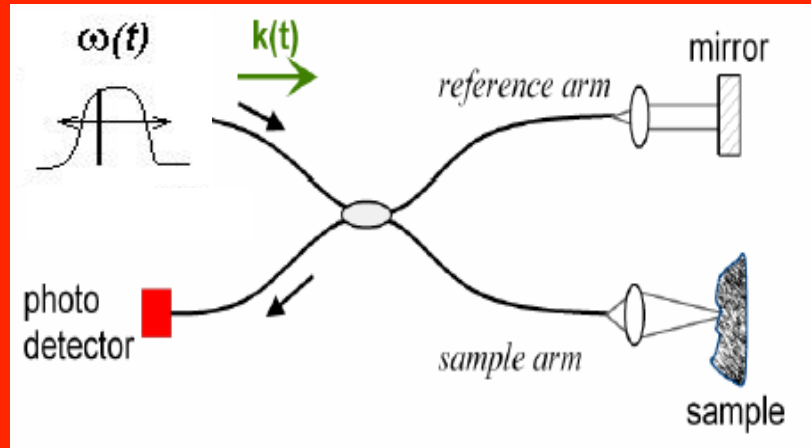
- OCT = **gold standard in intracoronary imaging**
To give more information than IVUS excepted in Ostial LM, or when you need to analyze the deepest layers of the plaque (landing zone)
- **OCT is essential :**
 - to guide complex procedure
 - to predict procedure complication (immediate, late...)
 - to validate new devices or strategies

New generation OCT :

- High resolution
- Easy to use

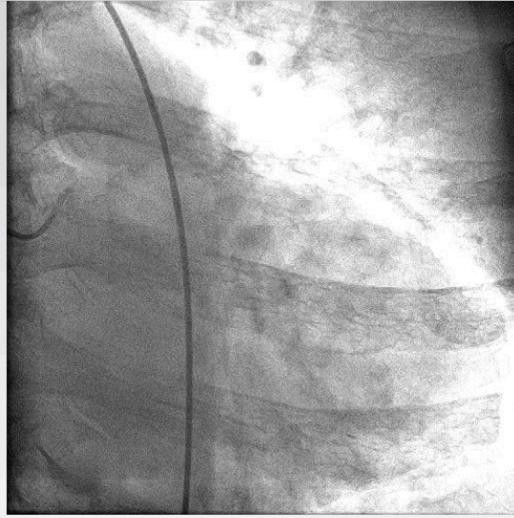


Frequency domain imaging=OFDI



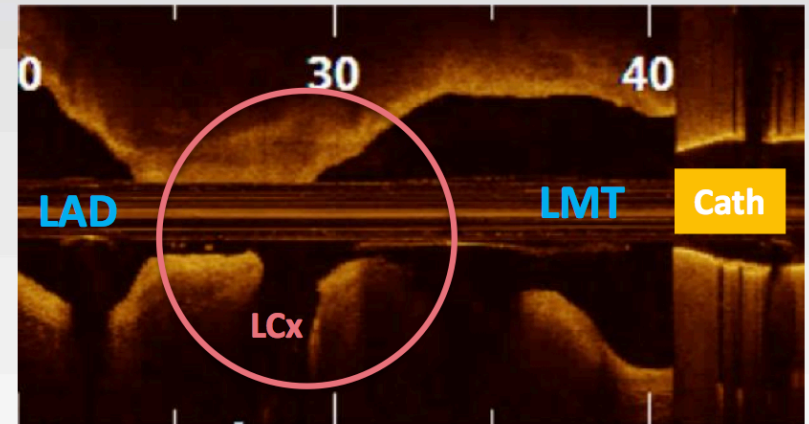
	OFDI/ OCT	IVUS	200	300	300	200
Resolution (μm)	10-20	80-150	200	300	300	200
Time aspect I	Real-time	Real-time	Real-time			Real-time
Time aspect II	2-50 sec	20-50 sec				30 sec
Type of scan source	IR-light	Ultrasound	X-rays	X-rays	Magnetic rays	Visible light
Imaging target	Layer	Layer	Bloodflow	Density	Density	Surface

Longitudinal Reconstruction of FD-OCT Images

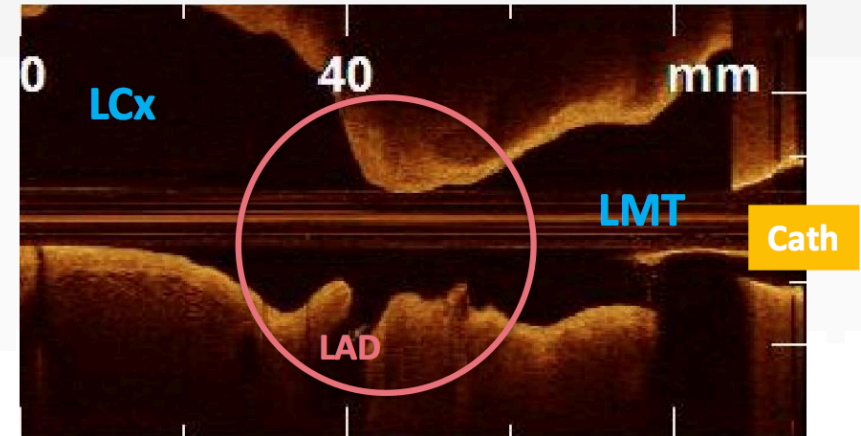


FD-OCT superior spatial resolution
fast pullback speed

Pullback from LAD to LMT



Pullback from LCx to LMT



OCT Characterization of Bifurcation Lesions

1) Plaque Morphology

Distribution

Tissue character

2) Condition of SB Ostium

Diameter

Shape

Plaque burden

3) Bifurcation Angle

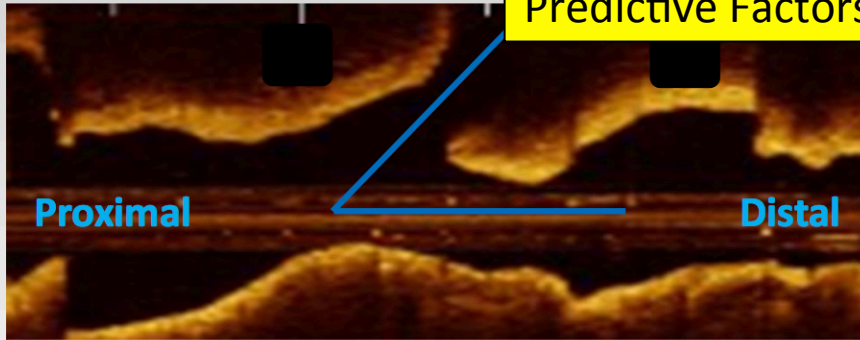
4) Carina Shape

5) Others

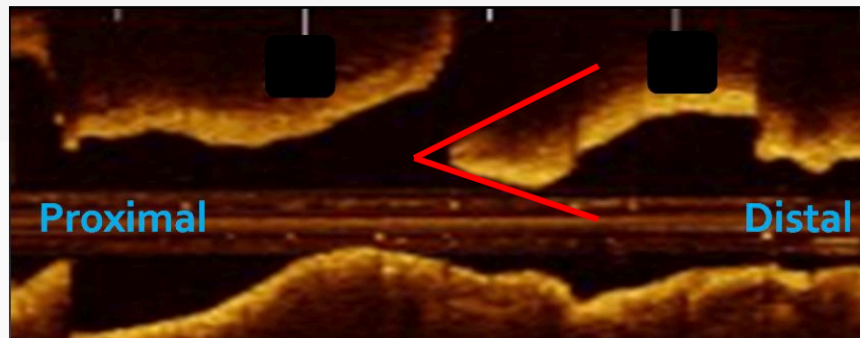
Dr Uemura

Planimetric Parameters of Bifurcation Lesion based on Longitudinal OCT Image

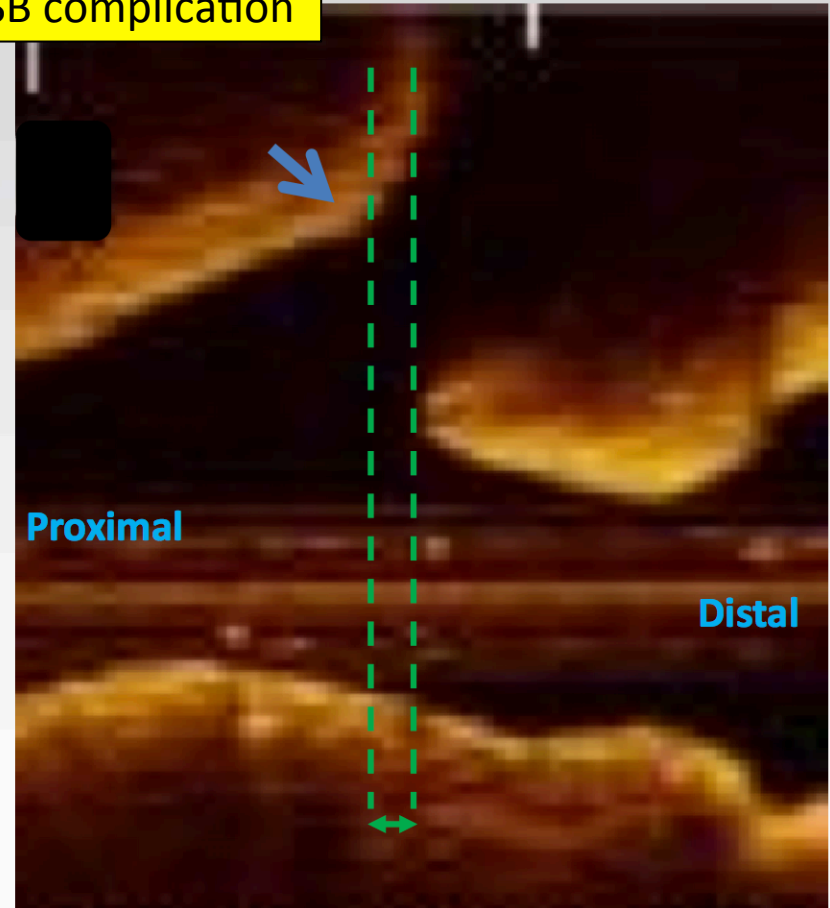
Predictive Factors of SB complication



SB angle : angle of side branch



CT angle : angle of carina tip



BP-CT length : distance between proximal branching-point (BP) to carina tip (CT)

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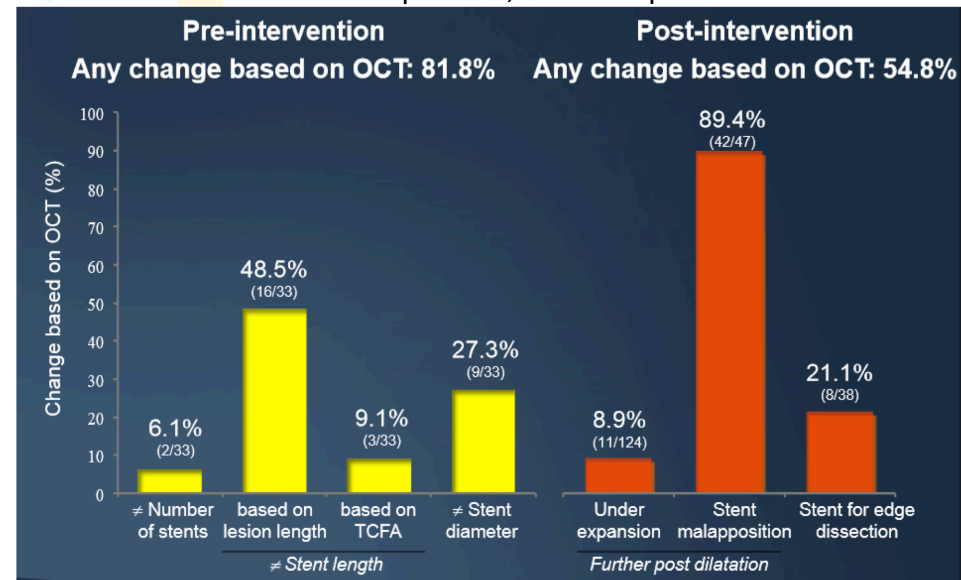
Merit of routine use of OCT in bifurcation treatment

- Accurate assessment
 - Plaque distribution
 - Calcification
 - Vulnerable plaque
 - Stent expansion / apposition
 - Protruded tissue or thrombus
 - Dissection (edge, intra-stent, POBA site)
 - GW recrossing point
 - Stent deformation / Destruction of strut alignment



Routine OCT-guide vs. Angio-guide

150 consecutive patients, 297 OCT pull backs



Dr Murasato



Bifurcation Stenting Guidance : OCT, IVUS, FFR & Angio

- Routine use of OCT can provide useful information in vessel condition before and after treatment, which changes the strategy in 50% of the cases.
- It can correct stent malapposition and underexpansion, which may lead to a decrease in cardiac death/MI.
- A decrease in contrast medium or use of dextran can afford to more frequent OCT pull-backs for further examination in the complicated lesion
- 3-D OCT imaging has a possibility to correct GW recrossing point, which leads to decrease in incomplete stent apposition, however, it still requires innovation of image qualities.

Bifurcation Stenting Guidance : OCT, IVUS, FFR & Angio

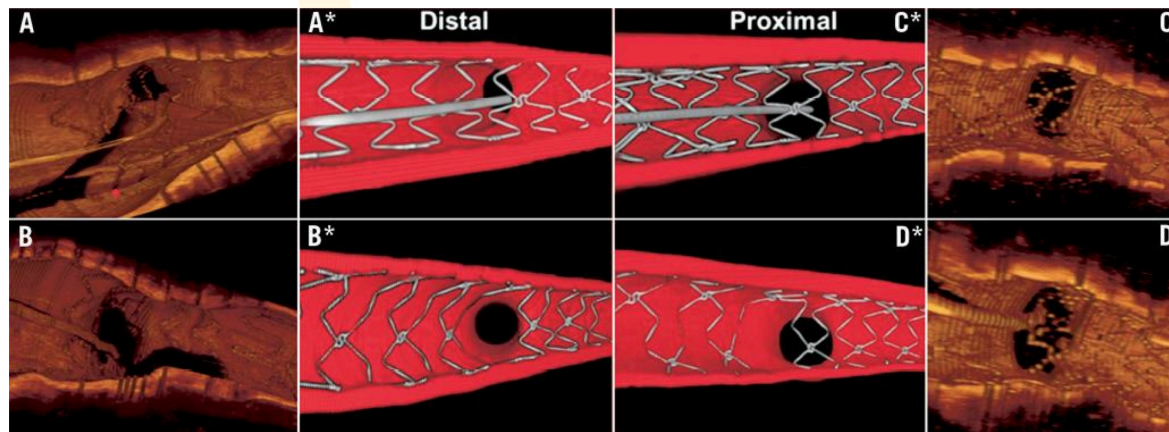
Message n°3

Post-processing algorithms from OCT imaging represent a real improvement and offers new perspectives

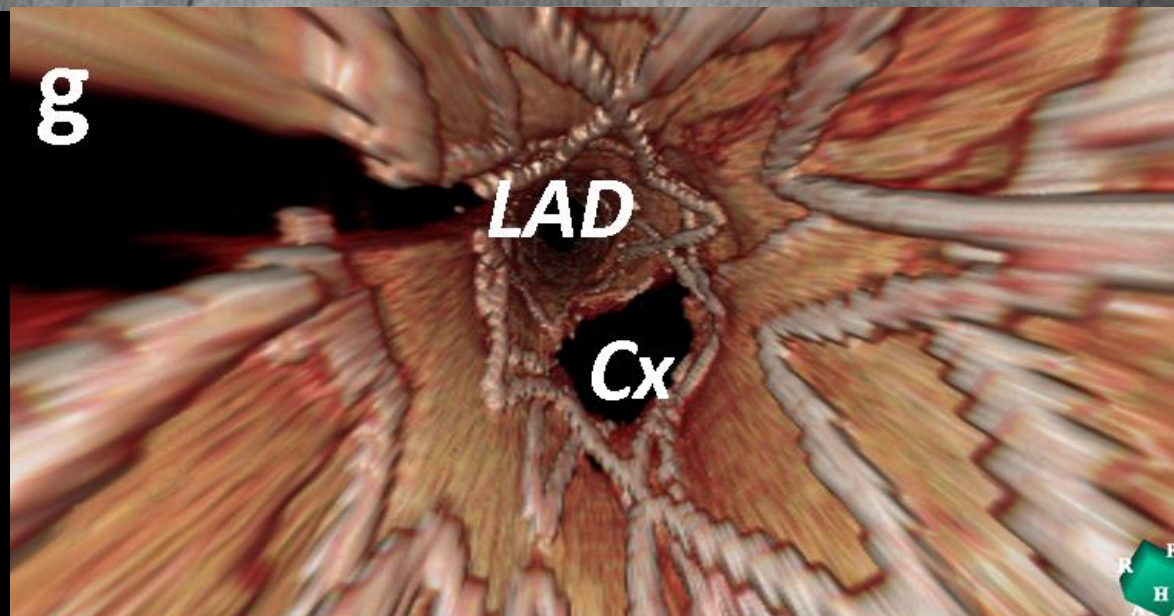
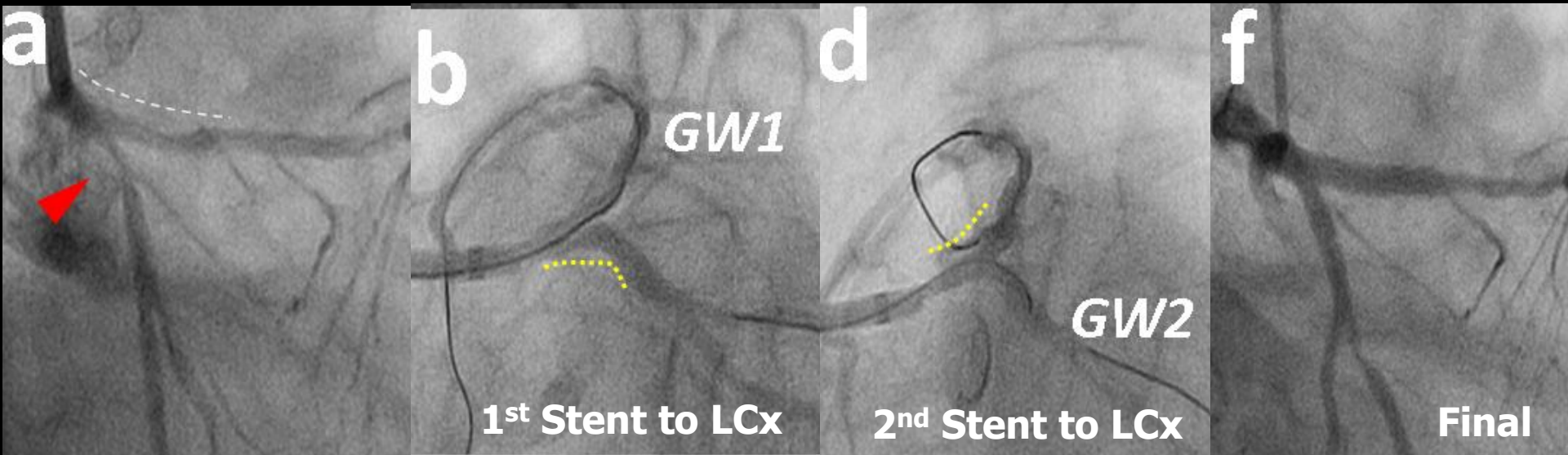


Confirmation of GW crossing point (1)

- OCT-guide (n=12) vs. angio-guide (n=40)
- First attempt: correct distal position 67%



In bifurcation, 3D-OCT may guide positioning of the wire through the appropriate (distal) cell



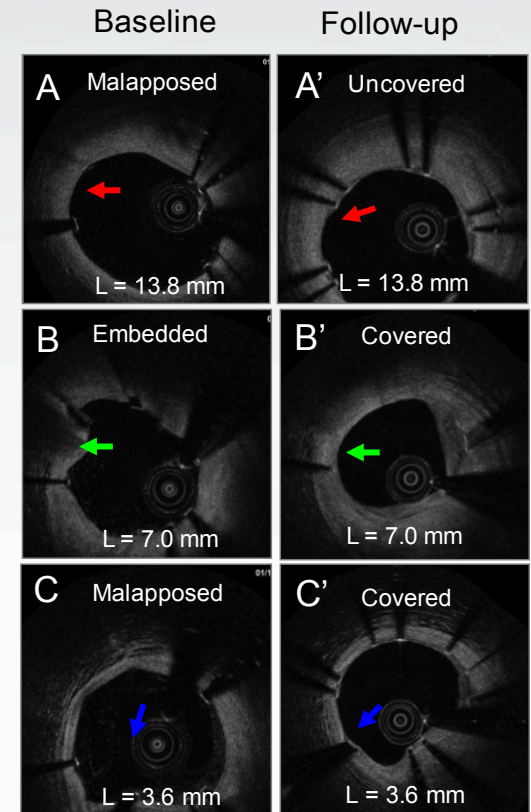
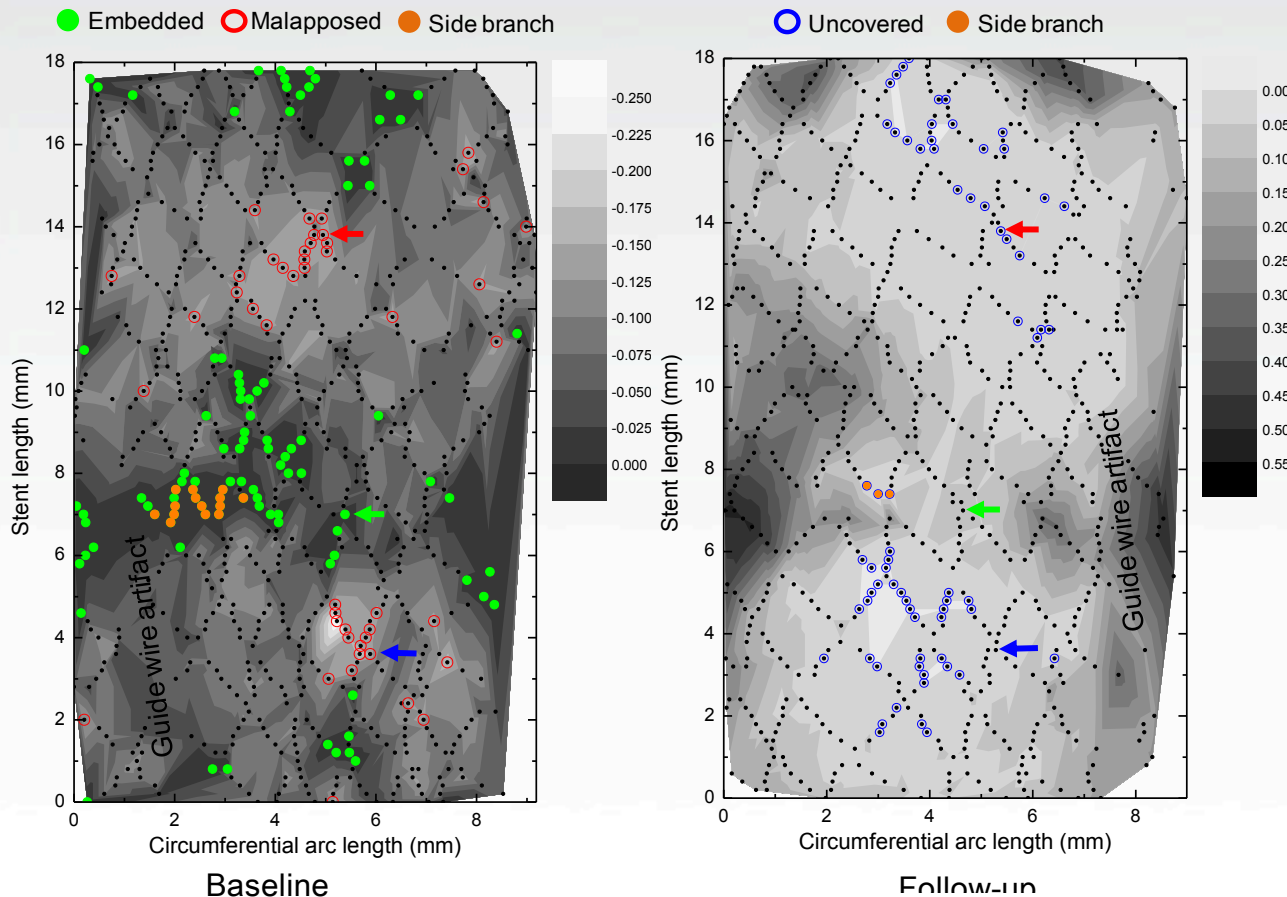
Dr Onuma

Contour Plot Analysis

Dr Kim

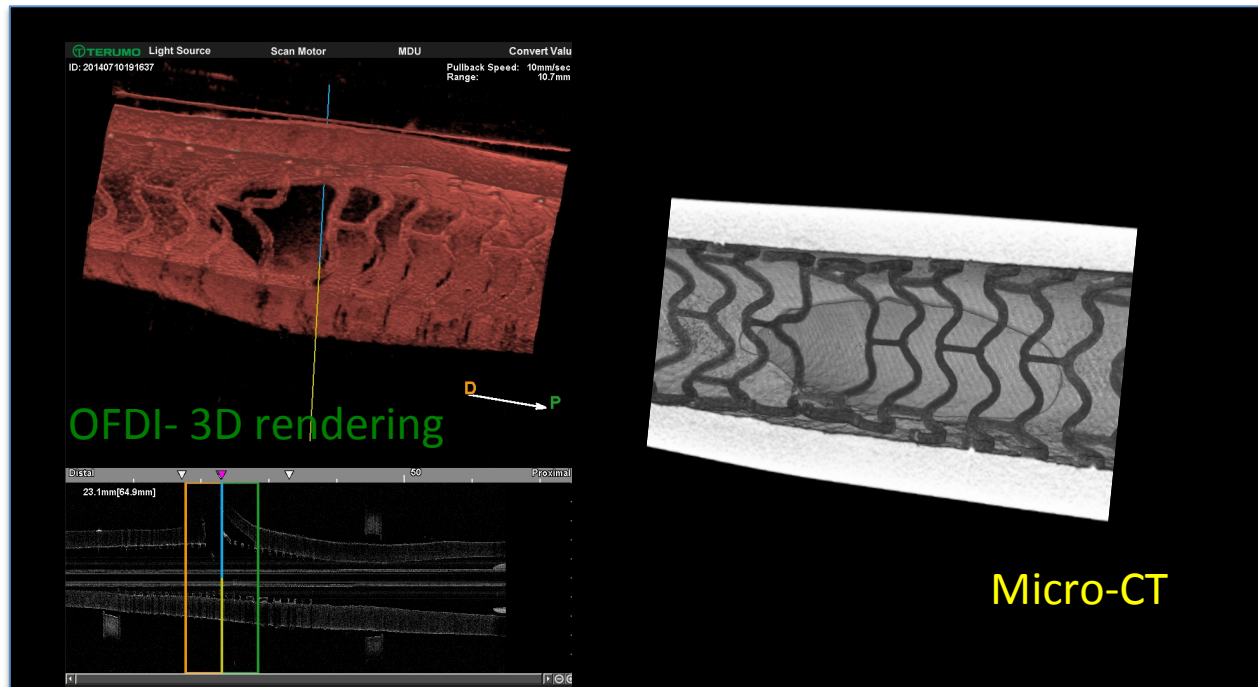
Software providing a Mapping of **neointimal healing process after stent implantation**.

Using this method, OCT-guided optimization of stent apposition is clearly shown to enhance the strut coverage.



OCT Guided **BVS implantation** in Bifurcation

- OCT is useful to better assess BVS in complex lesion
- **Good correlation with micro CT in bench study**
- **Essential to better know the potential and limits of BVS in Bifurcation treatment** *apposition, stent fracture, stent distortion, side branch access, wiring position*



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