Evaluation of Neointima in DES

Quantitative and Qualitative

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Neointima Evaluation

- Quantitative Measurement
- Qualitative Measurement

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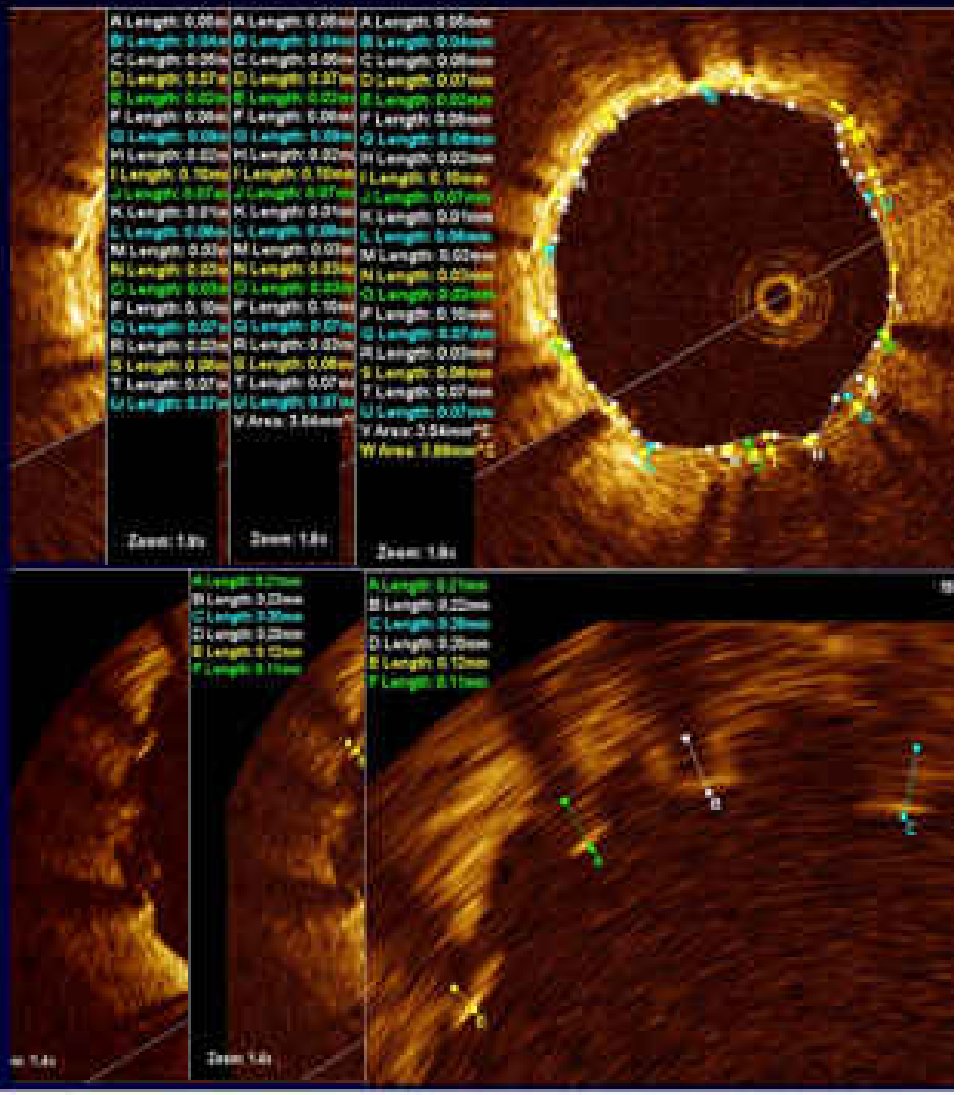
Optical Coherence Tomography Image Analysis

1. Neointimal thickness

The distances between the endo-luminal surface of neointimal and the strut reflection

2. Stent apposition

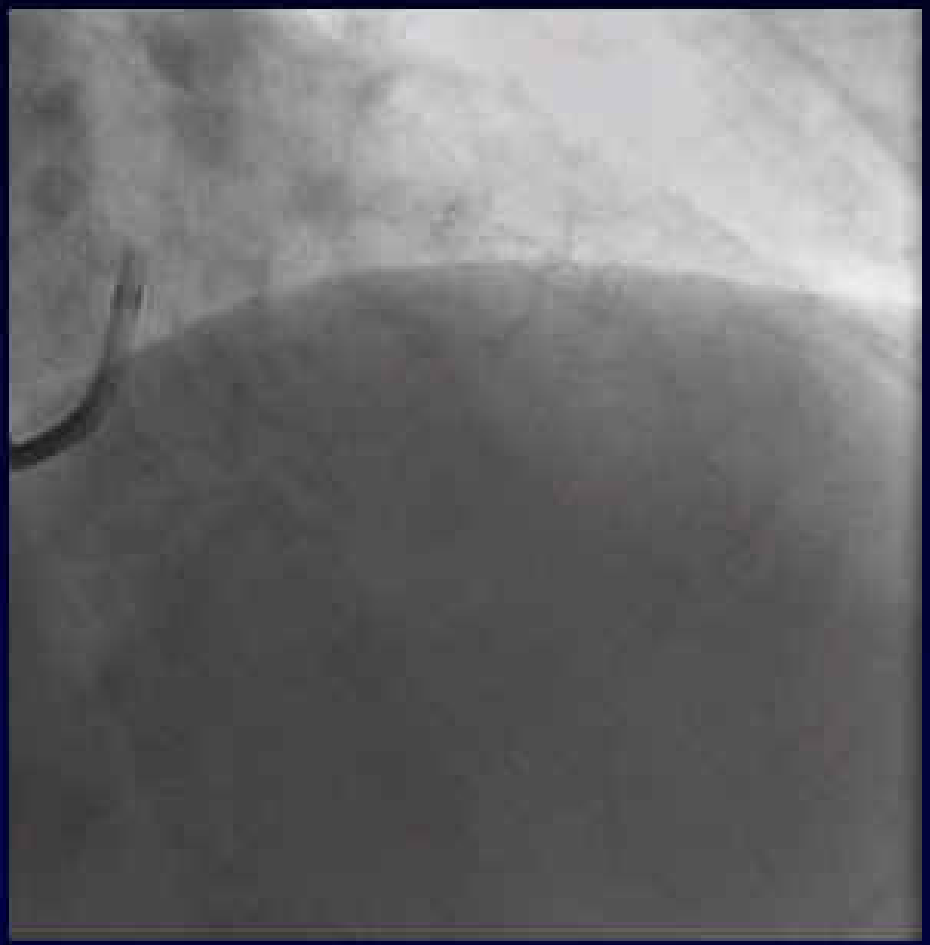
The distances between the endo-luminal surface of the strut reflection and the vessel wall



M/58 Lee JW

C.C.	Chest pain for 3 hours
Risk factor	DM(+), HTN(-), Smoking(-)
Lab	CK/CK-MB/TnT 116 / 3.43/ < 0.01 => f/u CK-MB 314.30 (6 hour)
ECG	ST elevation V2~V5
Diagnosis	STEMI

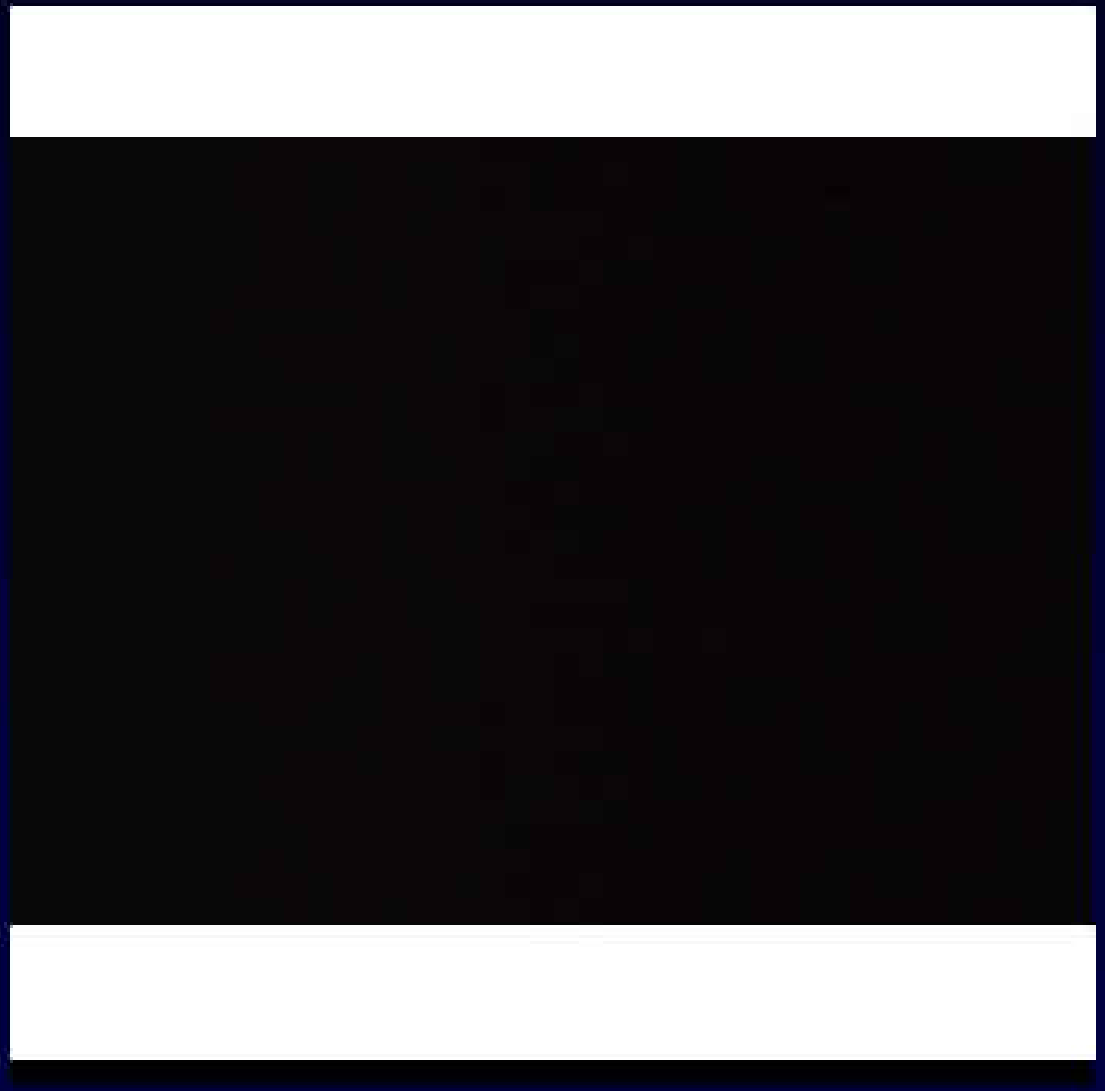
Primary PCI



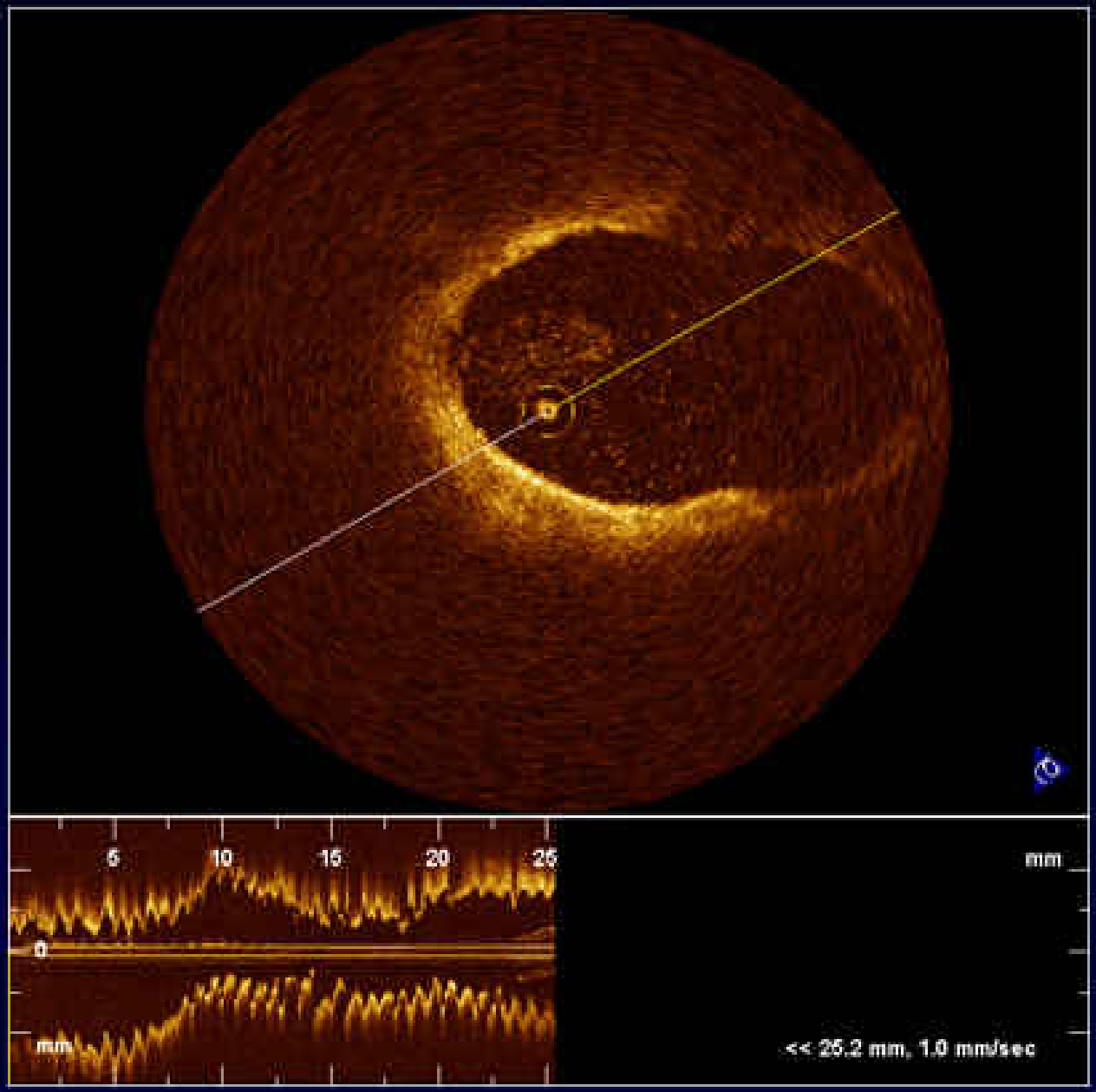
Guiding : JLG 7-4, GW : Pilot
Balloon predilation : 2.5 x 20mm
Stent : Cypher 3.0 x 18 mm

F/U CAG (9 month)

Patent M-LAD stent



9 mo-FU OCT after SES



F/69 Kim YJ

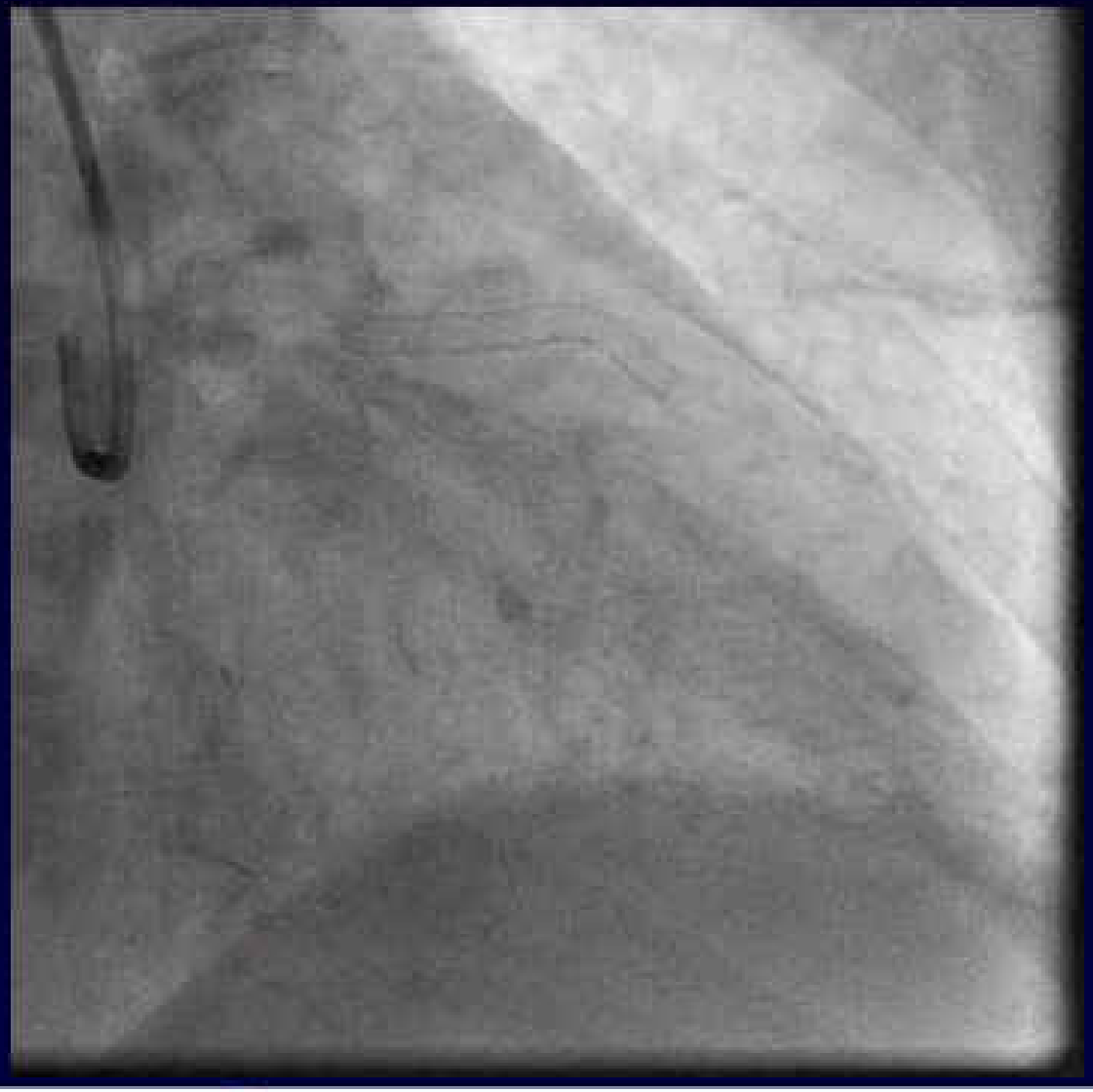
C.C	Squeezing chest pain for 2hrs
Risk	HTN(+) 12YA, PO
Factor	DM(+) 12YA, PO
	Smoking(-)
PHx	N-C
Progress	CK/CK-MB/TnT : 144 IU/mL / 12.8 / 0.149ng/mL
	NT-proBNP 1020 pg/mL

Primary PCI

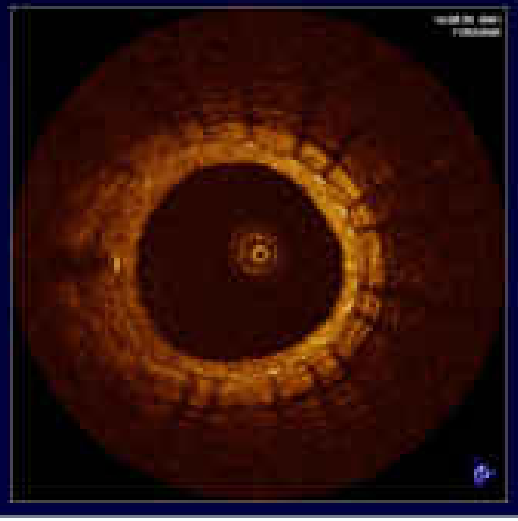
Guiding : EBU 7-3.5
Balloon predilation : 2.5 x 20mm, 10 atm
Stent : Endeavor 3.0 x 30 mm

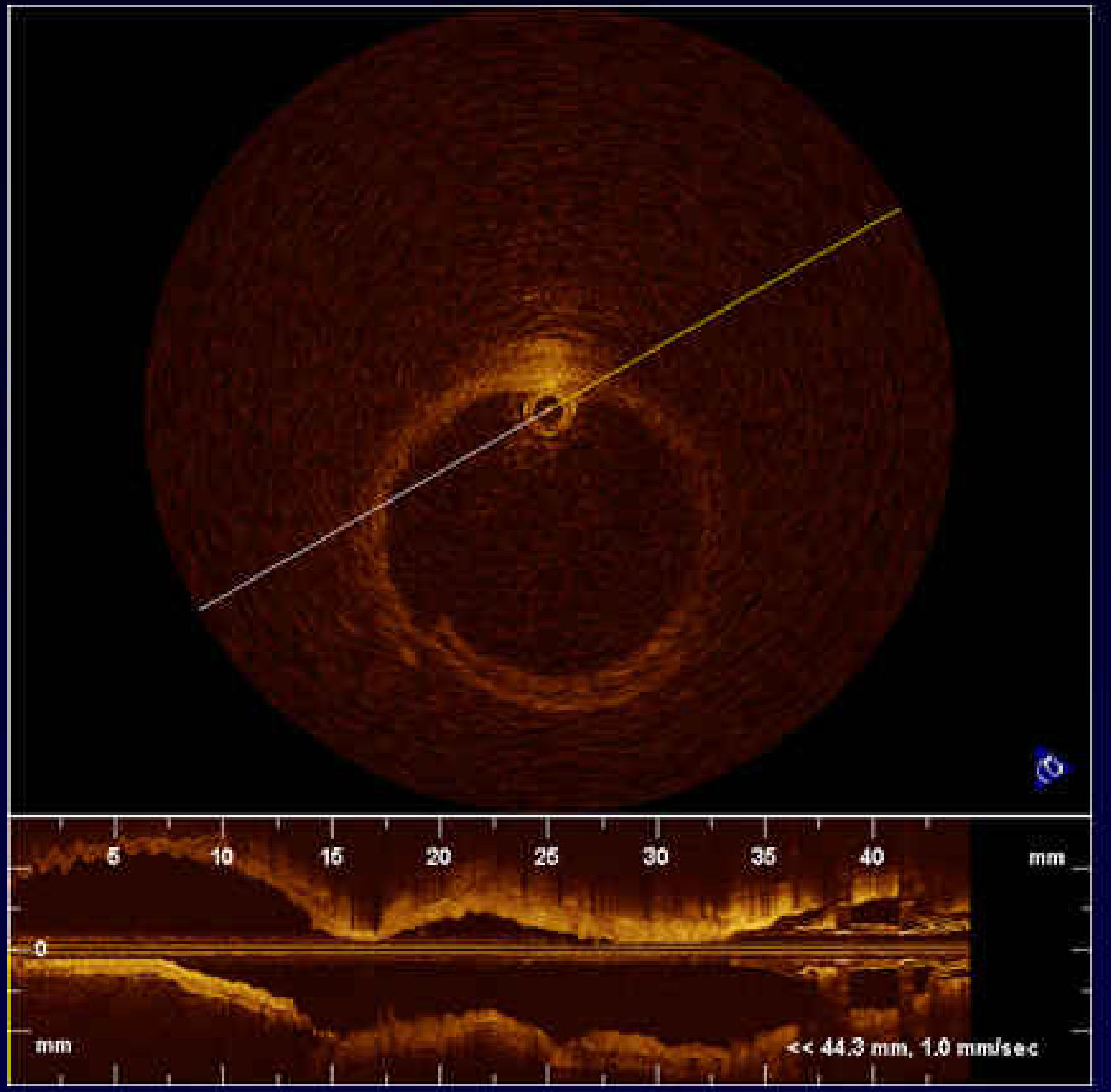
F/U CAG (9 month)

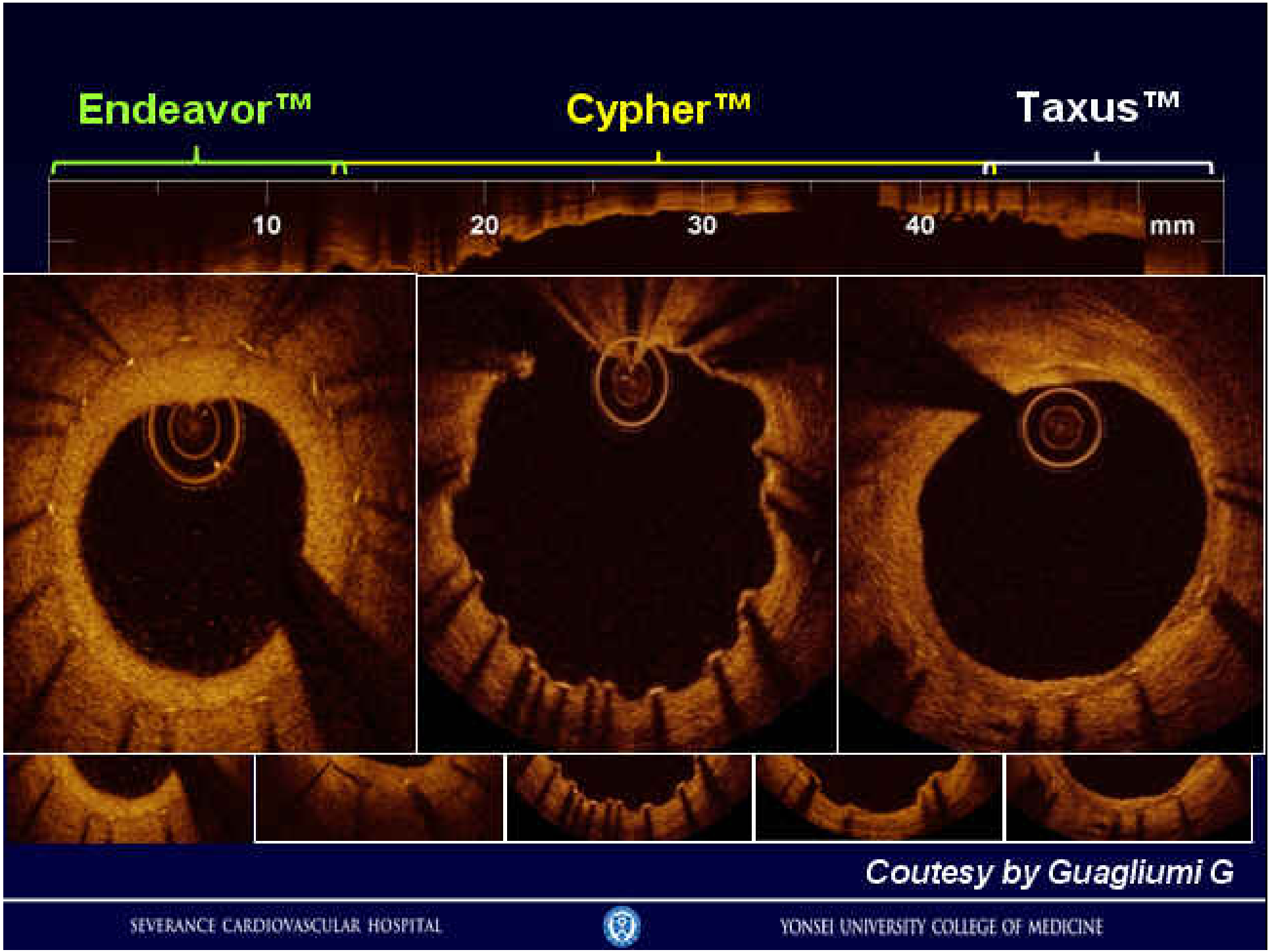
Patent mLAD stent



9 mo OCT
ZES sprint

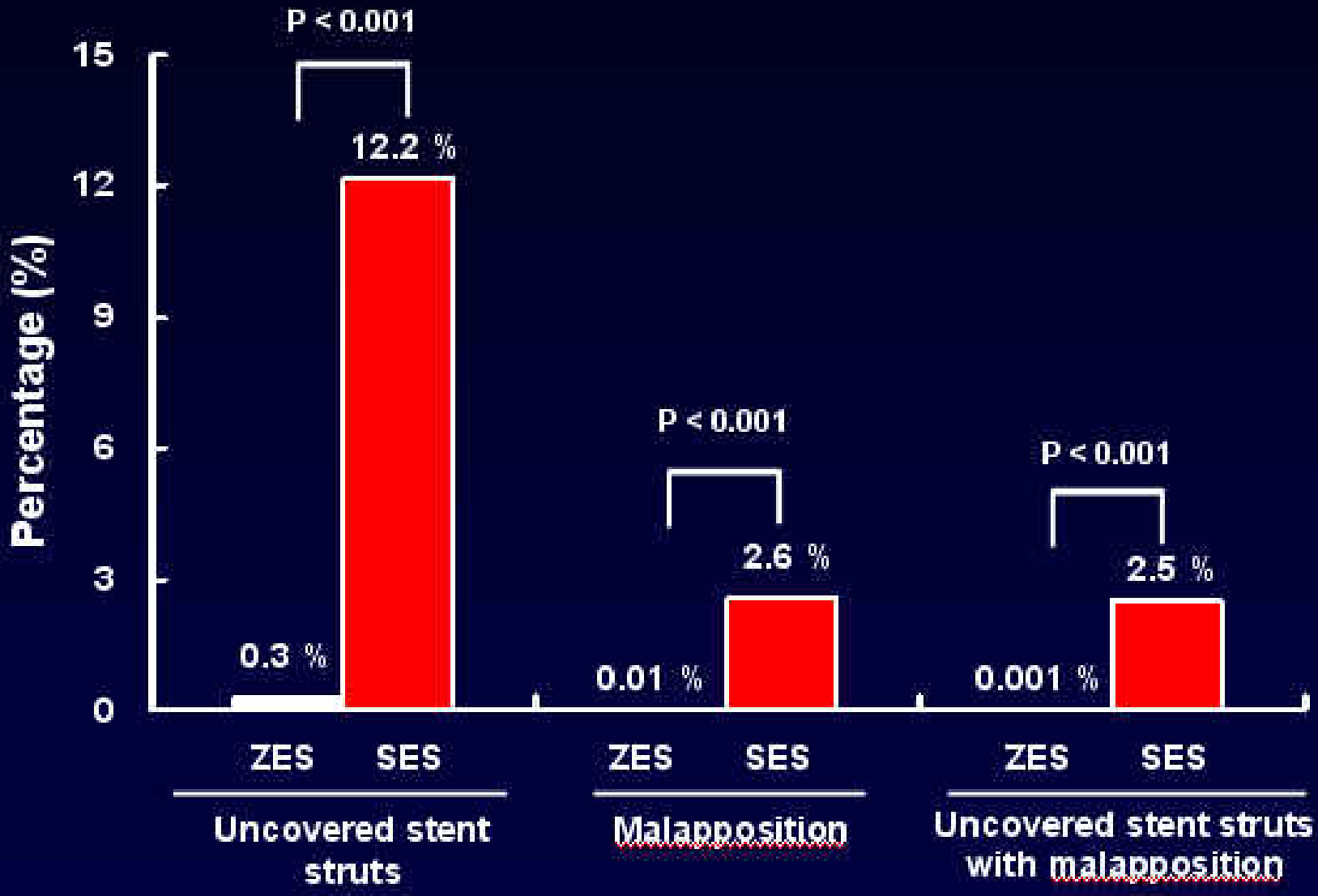






Coutesy by Guagliumi G

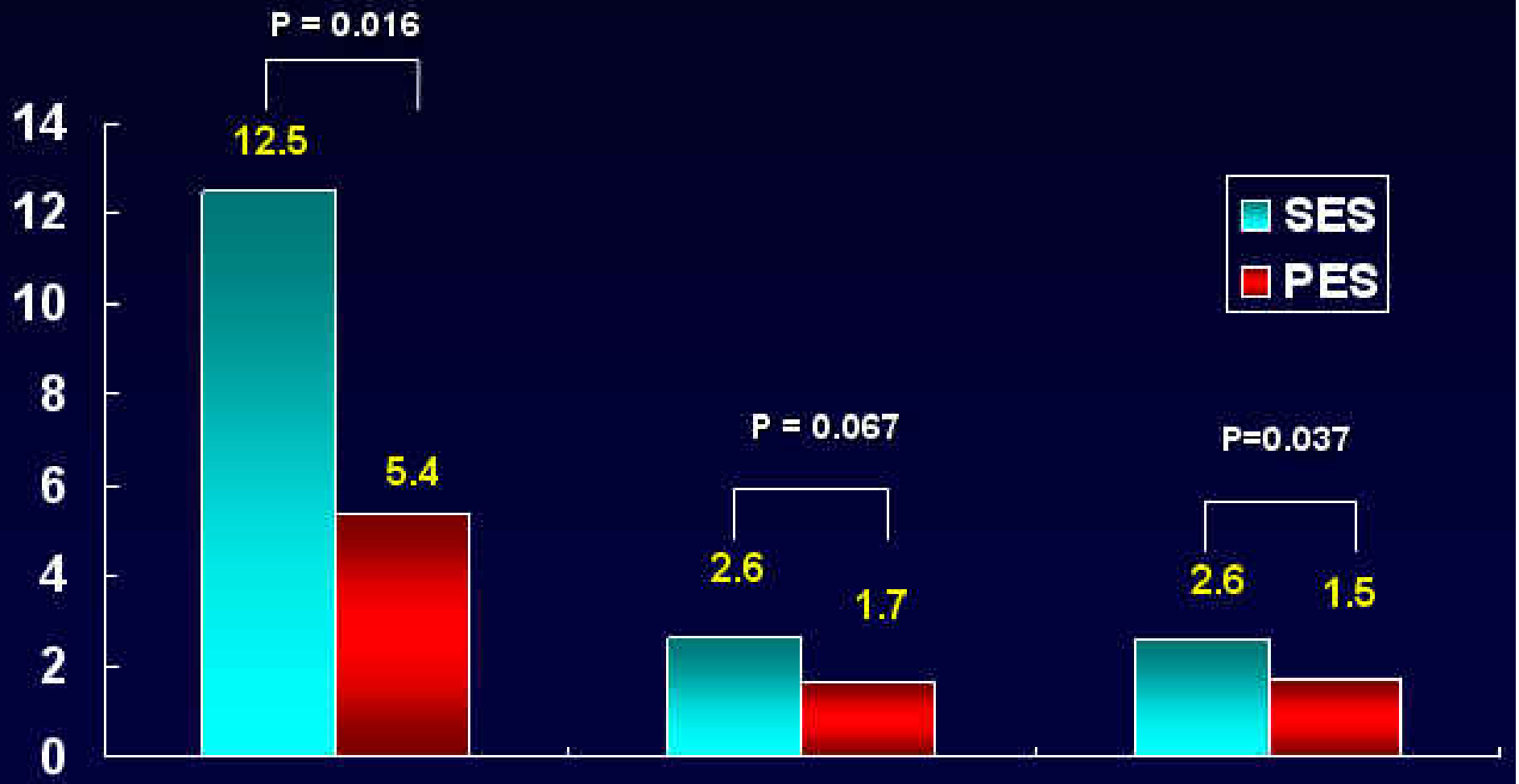
OCT Evaluation of ZES at 9 Month FU



Kim JS, Jang Y et al. Heart 2009 in press

OCT findings 68 patients (33 SES and 24 PES)

1379 mm in stent length including 11,837 struts



Kim JS, Kim JS, et al. Circuation J 2009 in press

Neointima Evaluation

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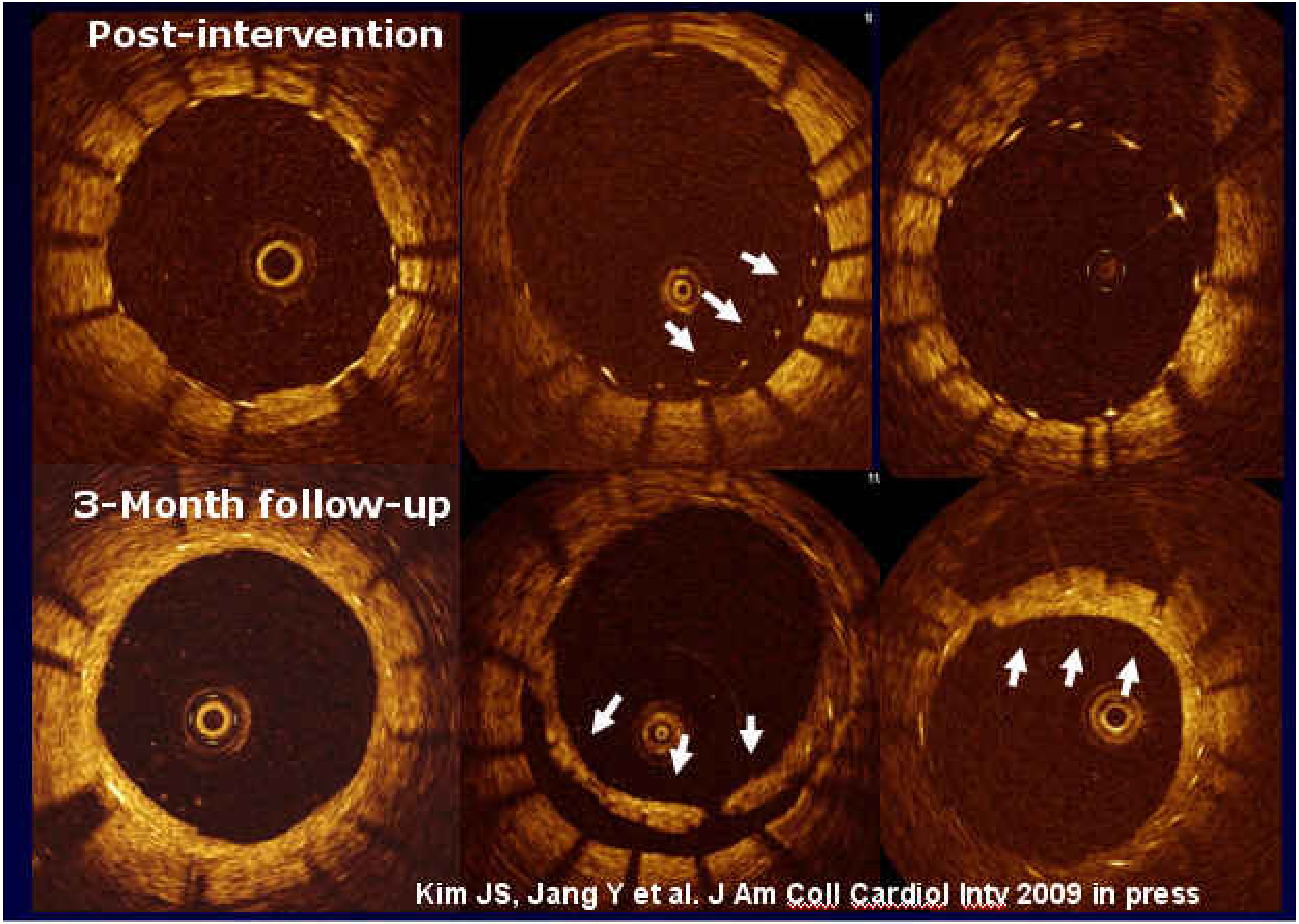
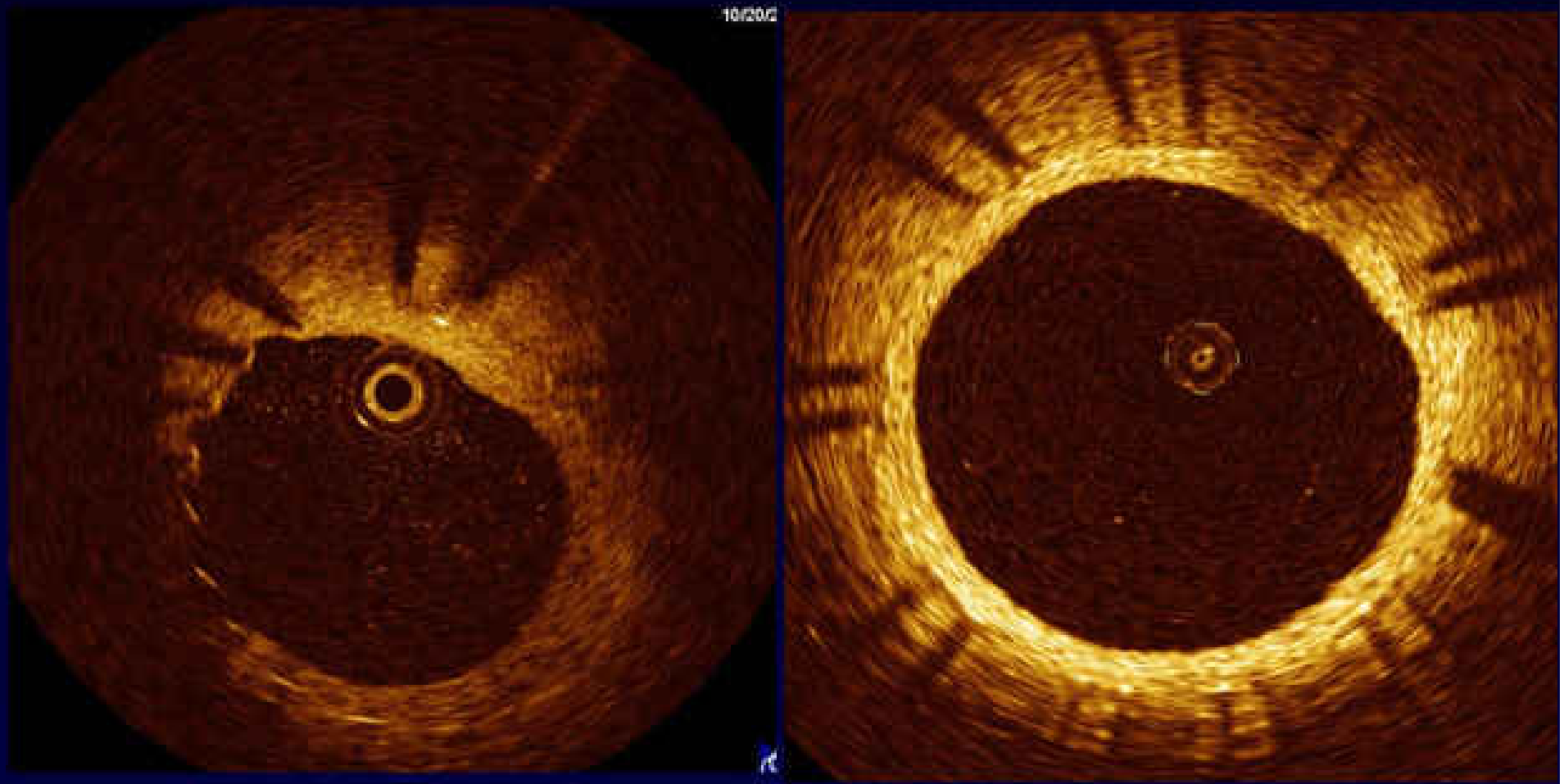
- Qualitative Measurement

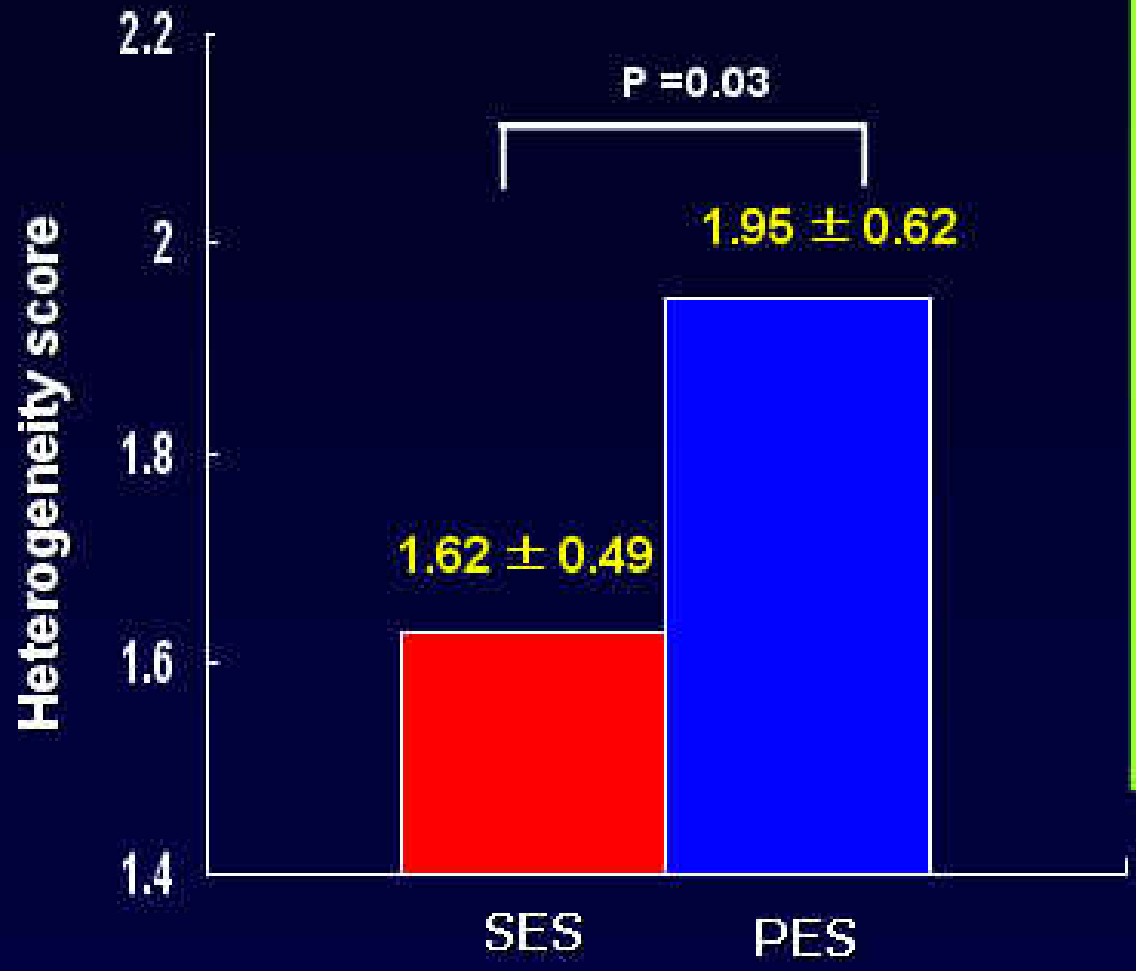

Post-intervention
3-Month follow-up
Kim JS, Jang Y et al. J Am Coll Cardiol Intv 2009 in press

Qualitative Measurement

Heterogeneous pattern of neointima



The heterogeneity score between SES and PES



Heterogeneity score was defined as subtraction between maximal and minimal neointimal grade

The status of NIH thickness at each cross section was divided into 4 grades;

Grade 0: exposed strut

Grade 1: NIH thickness < 100 μm ,

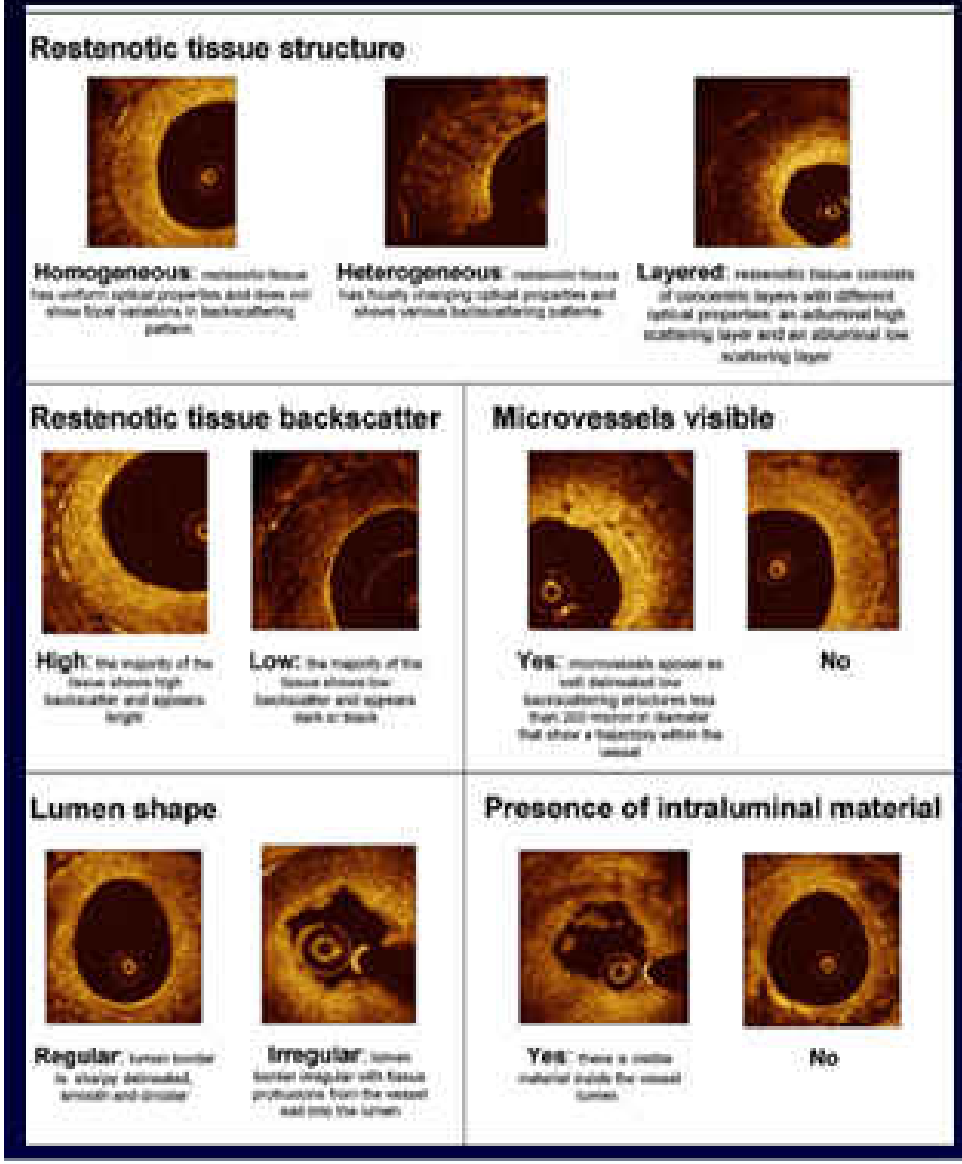
Grade 2: NIH thickness between 100 and 200 μm,

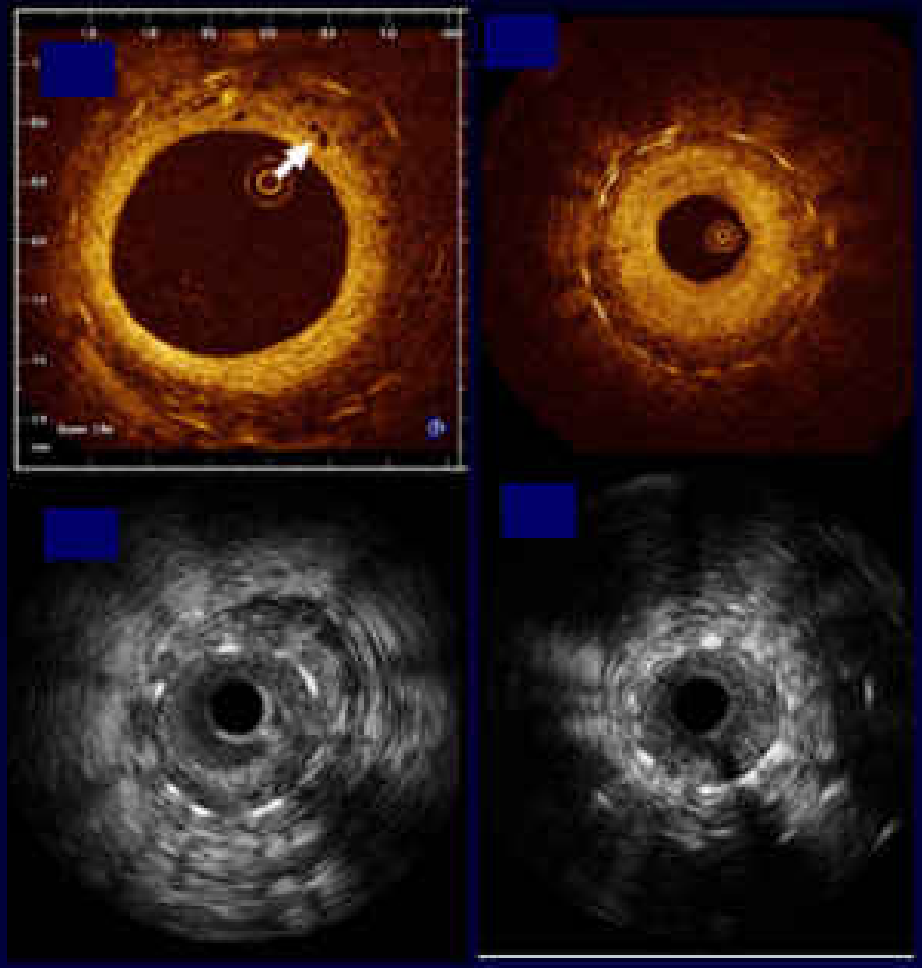
Grade 3: NIH thickness over 200 μm.

The grade was determined as minimal grade including ≥ 10 % of stent struts at each stent

Kim JS, Kim JS, et al. Circuation J 2009 in press

Pattern of restenotic tissue

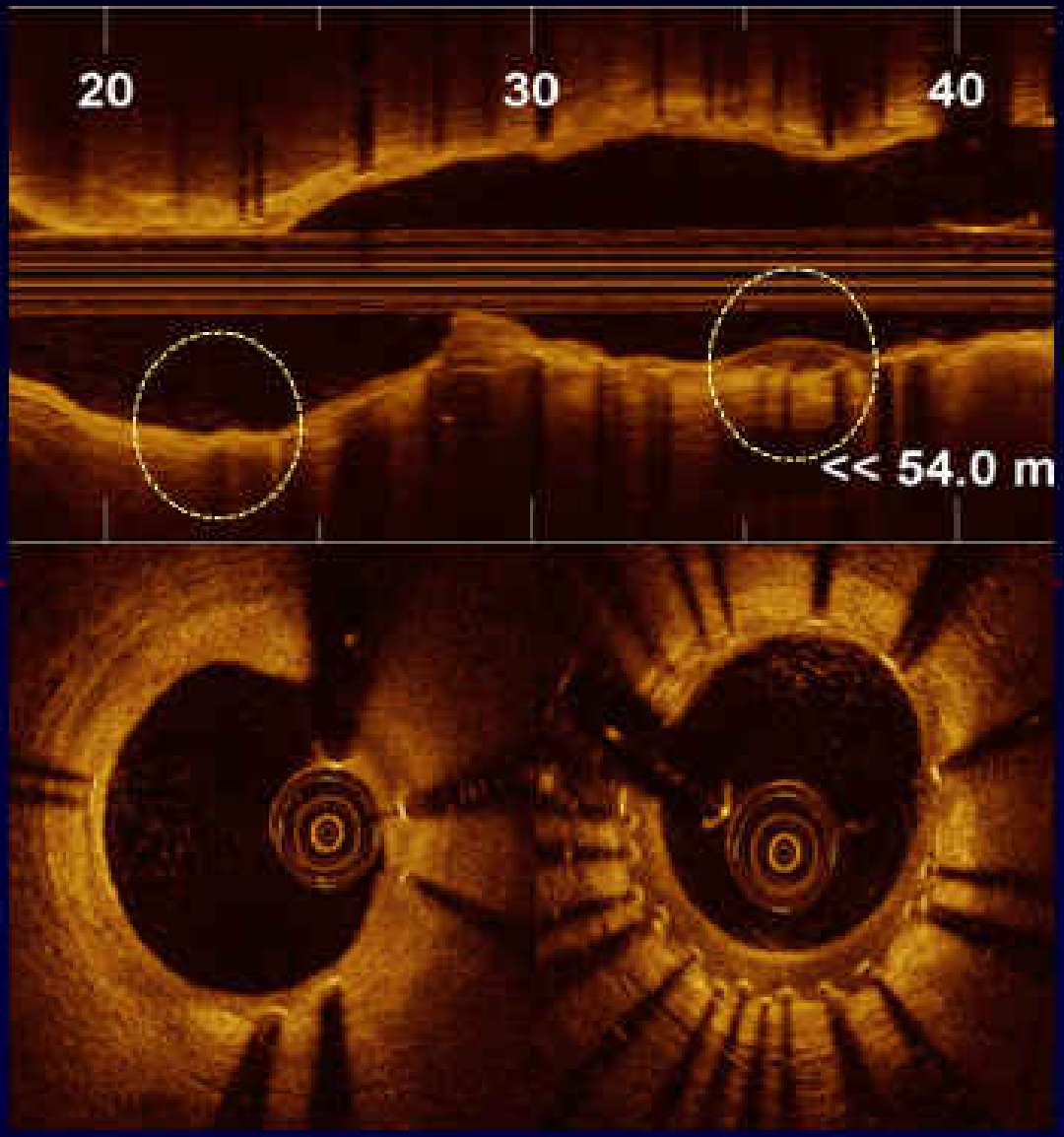




Gonzalo N et al, Am Heart J 2009 158: 284-93

2nd generation DES 3.0/18 +3.0/18 mm

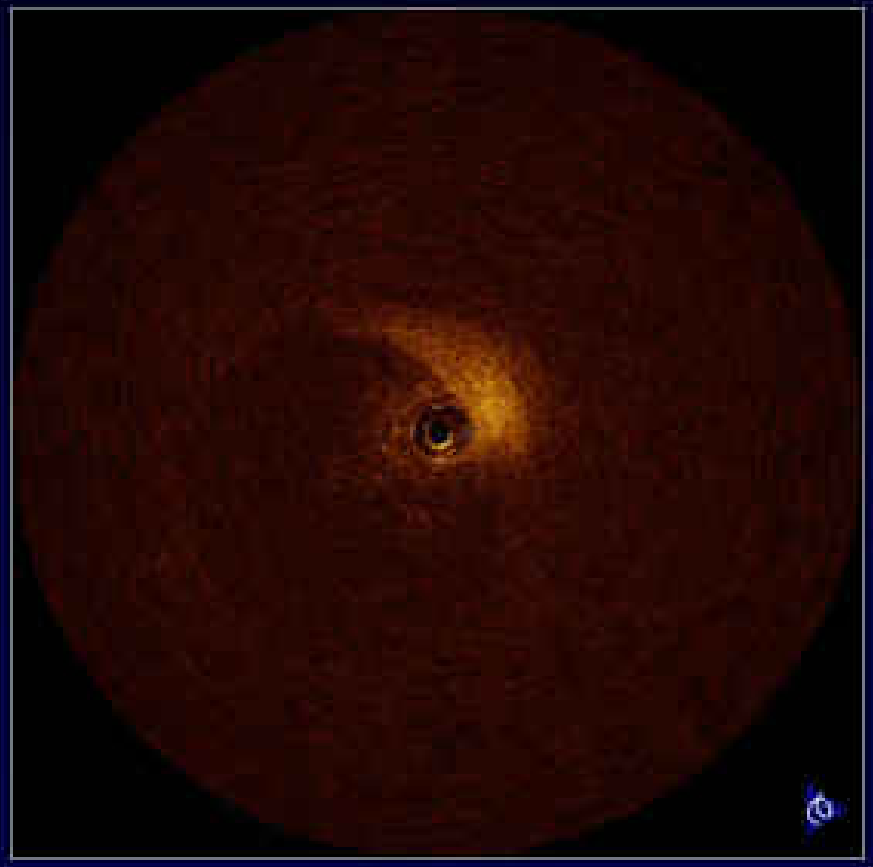
3 mon FU



Coutesy by Guagliumi G

Quality of Neointima

Abnormal pattern of neointima



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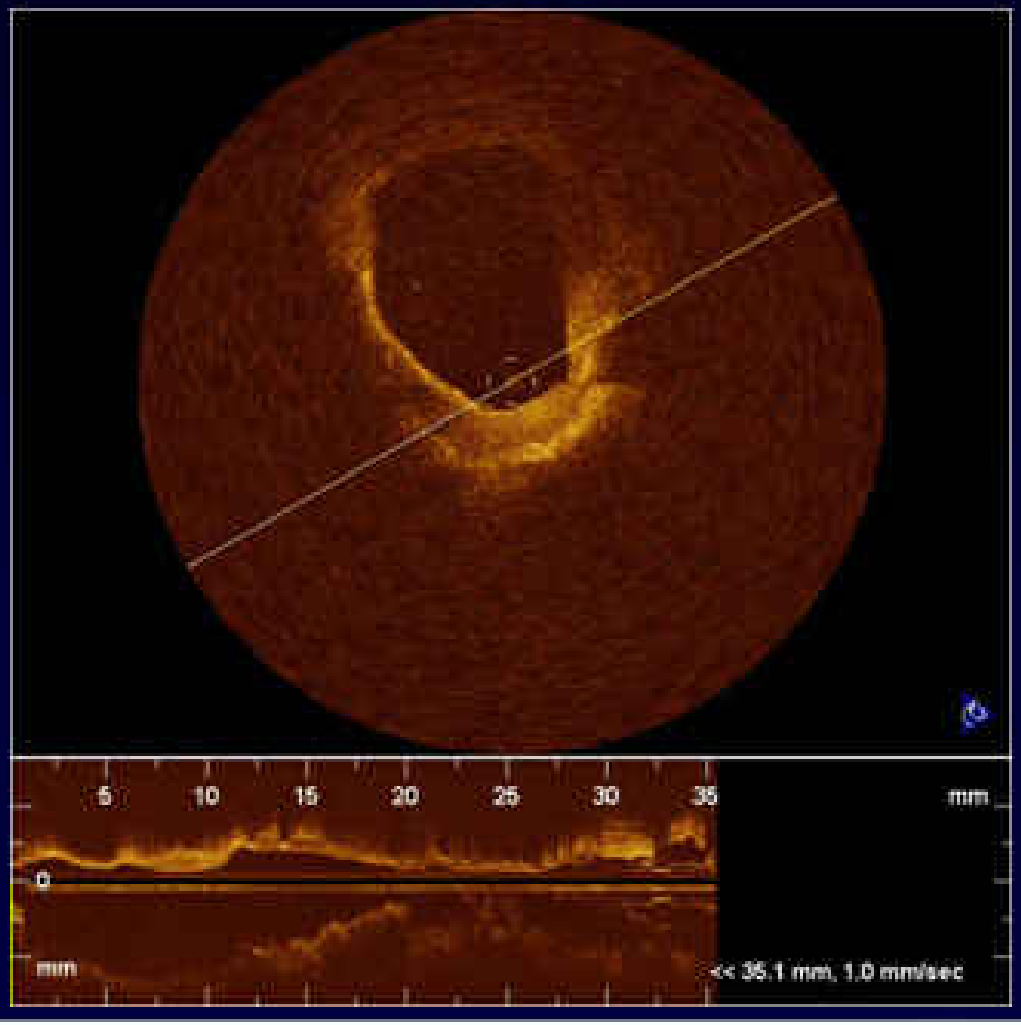

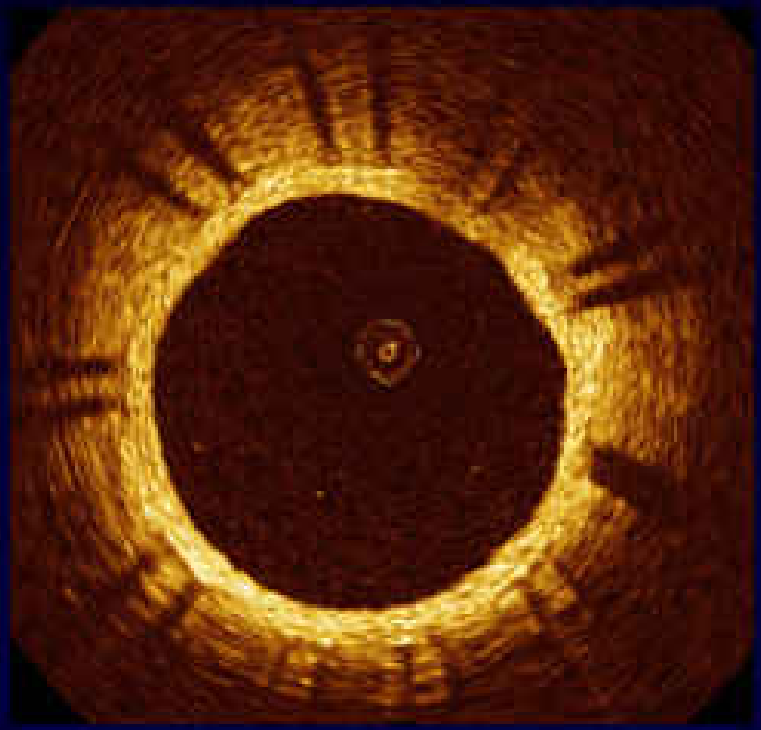

Summary

- OCT can better visualize and estimate thin neo-intima after DES implantation.
- The pattern of vascular healing was somewhat different depending on the types of DES.
- Clinical implications of various OCT dfindings needs to be investigated in further studies.
- Definition of tissue characterization and stent evaluation needs to be standardized.