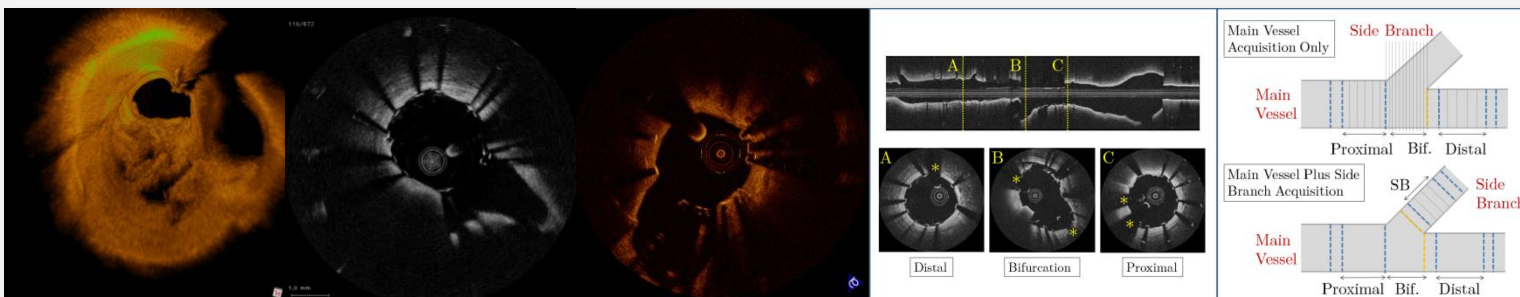
Consensus statement on use and analysis of optical coherence tomography in coronary bifurcations

A joined EBC and IWG-IVOCT subcomittee



Update - EBC 2013

European Bifurcation Club

EBC

The International Working Group
For Intracoronary OCT Standardization And Validation

Niels R. Holm

Agenda

- Consensus standards on use and analysis of OCT in coronary bifurcations
- Only topics unique to bifurcations
- Adoption of the IWG-IVOCT consensus:

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MINI-FOCUS ISSUE: OPTICAL COHERENCE TOMOGRAPHY

Clinical Research

Consensus Standards for Acquisition, Measurement, and Reporting of Intravascular Optical Coherence Tomography Studies

A Report From the International Working Group for Intravascular Optical Coherence Tomography Standardization and Validation

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Objectives The purpose of this document is to make the output of the International Working Group for Intravascular Optical Coherence Tomography (IWG-IVOCT) Standardization and Validation available to medical and scientific communities, through a peer-reviewed publication, in the interest of improving the diagnosis and treatment of patients with atherosclerosis, including coronary artery disease.

Background Intravascular optical coherence tomography (IVOCT) is a catheter-based modality that acquires images at a resolution of ~10 μm, enabling visualization of blood vessel wall microstructure in vivo at an unprecedented level of detail. IVOCT devices are now commercially available worldwide, there is an active user base, and the interest in using this technology is growing. Incorporation of IVOCT in research and daily clinical practice can be facilitated by the development of uniform terminology and consensus-based standards on use of the technology, interpretation of the images, and reporting of IVOCT results.

Methods The IWG-IVOCT, comprising more than 260 academic and industry members from Asia, Europe, and the United States, formed in 2008 and convened on the topic of IVOCT standardization through a series of 9 national and international meetings.

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Participants, so far..

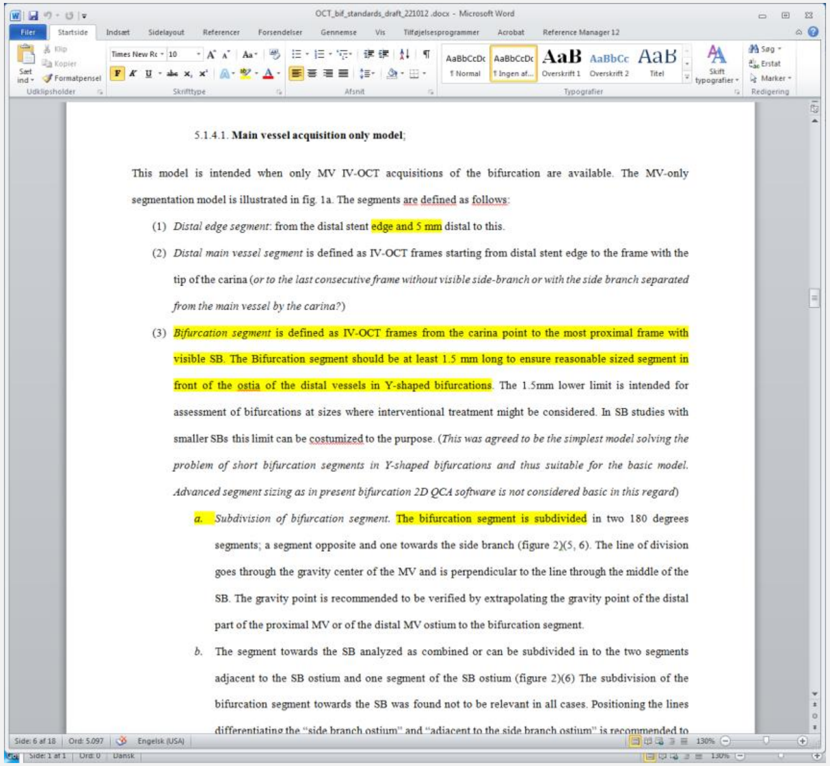
- Carlo DiMario
- Nicolas Foin
- Giulio Guagliumi
- Vasile Sarbu
- Indulis Kumsars
- Attila Thury
- Imre Ungi
- Gary Mintz
- Ulf Landmesser
- Jouke Dijkstra
- Juan Luis Gutiérrez-Chico
- Stefan Kralev
- Marc Feldman
- Antonios Karanasos
- Evald Høj Christiansen
- Francesco Burzotta
- Shengxian Tu
- Johan H.C. Reiber
- Giovanni Ughi
- Inga Narbute
- Dace Juhnevica
- Ioannis Iakovou
- Marc Feldman
- Takashi Akasaka
- Evelyn Regar
- Gary Tearney
- Tom Adriaenssens (co-chair)
- Niels Ramsing Holm (chair)

Meetings, so far..

- EuroPCR 2012 *Paris - founding*
- ESC 2012 *Munich*
- EBC 2012 *Barcelona*
- TCT 2012 *Miami*

The document

- 23 pages
- 44 references



5.1.4.1. **Main vessel acquisition only model**;

This model is intended when only MV IV-OCT acquisitions of the bifurcation are available. The MV-only segmentation model is illustrated in fig. 1a. The segments are defined as follows:

(1) *Distal edge segment*: from the distal stent edge and 5 mm distal to this.

(2) *Distal main vessel segment* is defined as IV-OCT frames starting from distal stent edge to the frame with the tip of the carina (*or to the last consecutive frame without visible side-branch or with the side branch separated from the main vessel by the carina?*)

(3) *Bifurcation segment* is defined as IV-OCT frames from the carina point to the most proximal frame with visible SB. The Bifurcation segment should be at least 1.5 mm long to ensure reasonable sized segment in front of the ostia of the distal vessels in Y-shaped bifurcations. The 1.5mm lower limit is intended for assessment of bifurcations at sizes where interventional treatment might be considered. In SB studies with smaller SBs this limit can be costumized to the purpose. (*This was agreed to be the simplest model solving the problem of short bifurcation segments in Y-shaped bifurcations and thus suitable for the basic model. Advanced segment sizing as in present bifurcation 2D QCA software is not considered basic in this regard*)

a. *Subdivision of bifurcation segment.* The bifurcation segment is subdivided in two 180 degrees segments; a segment opposite and one towards the side branch (figure 2)(5, 6). The line of division goes through the gravity center of the MV and is perpendicular to the line through the middle of the SB. The gravity point is recommended to be verified by extrapolating the gravity point of the distal part of the proximal MV or of the distal MV ostium to the bifurcation segment.

b. The segment towards the SB analyzed as combined or can be subdivided in to the two segments adjacent to the SB ostium and one segment of the SB ostium (figure 2)(6) The subdivision of the bifurcation segment towards the SB was found not to be relevant in all cases. Positioning the lines differentiating the "side branch ostium" and "adjacent to the side branch ostium" is recommended to

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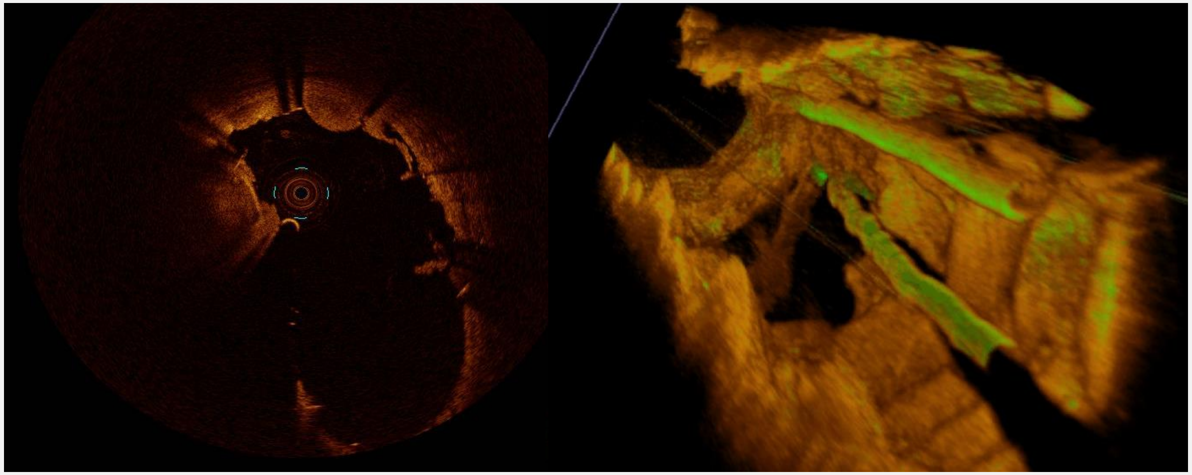
Topics: Image acquisition

- Wires and wire shadows?

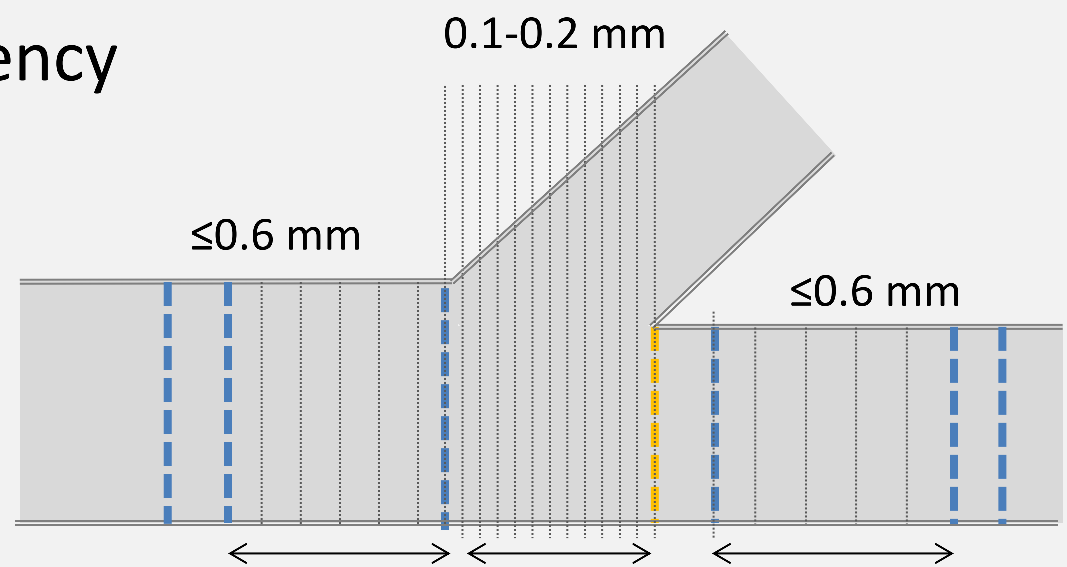


- At least one wire (access, oscillations)

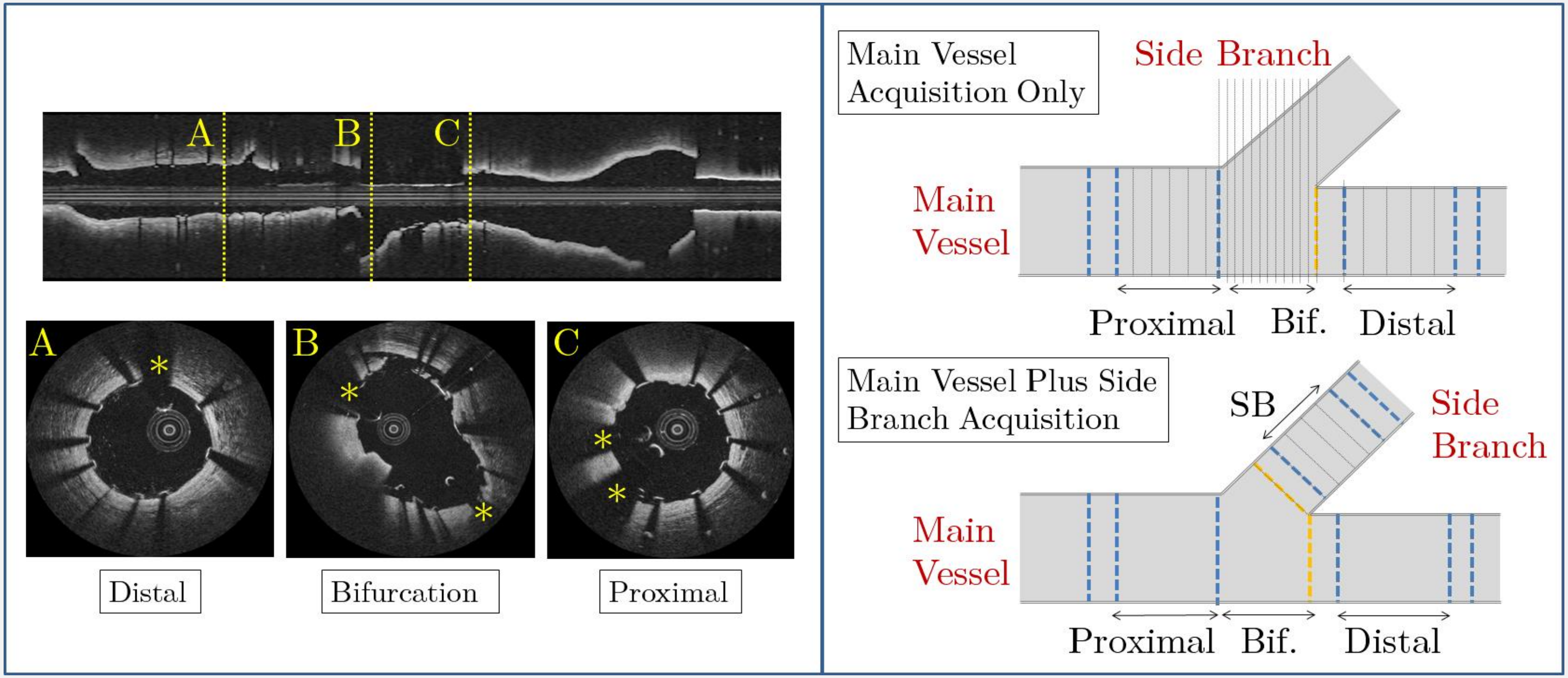
Topics: Image acquisition

- MV and SB acquisitions if safe
  - not in jailed SBs

- Sample frequency



Topics: Basic analysis



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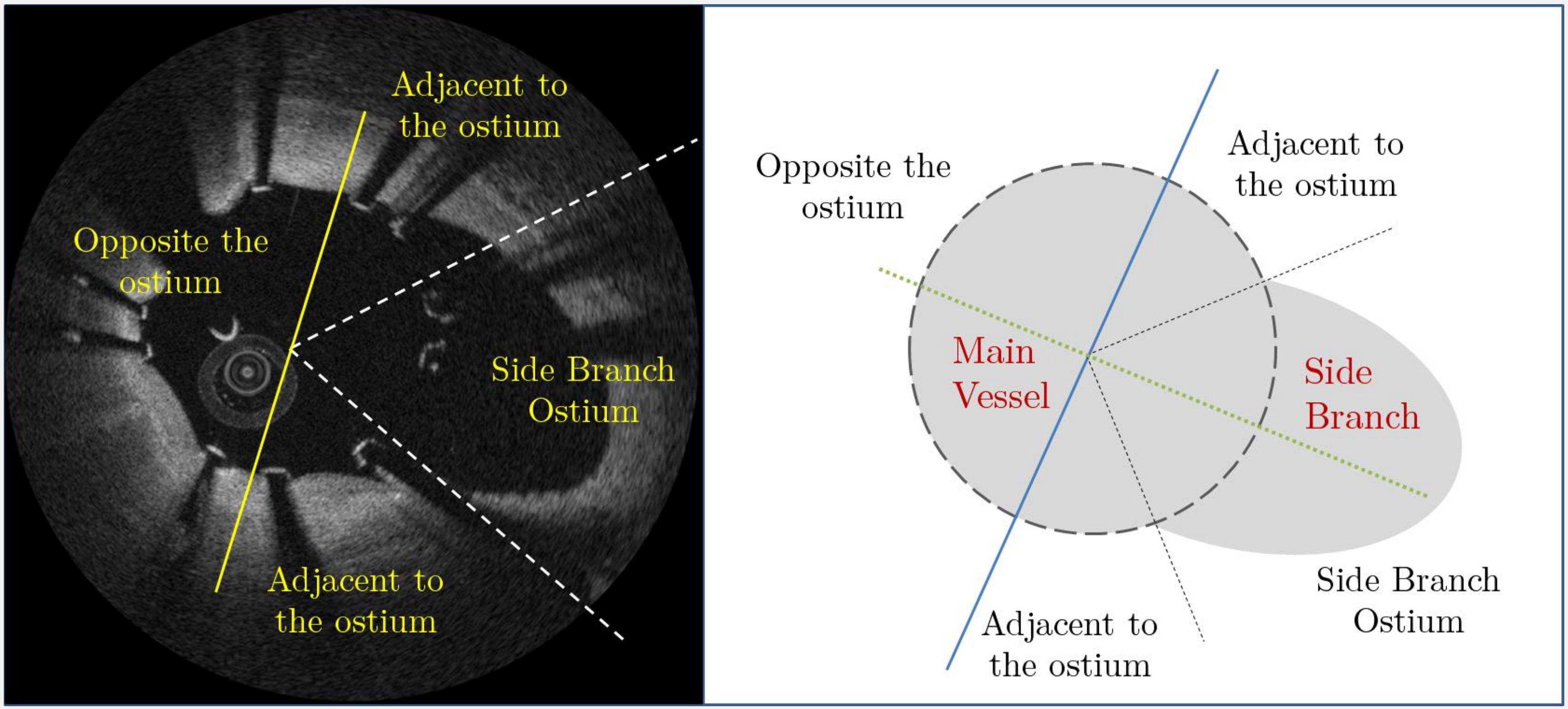
Topics: Basic analysis



adopted from Tyczynski et al, Rev Esp Cardiol 2010 and Kyono et al, EuroIntv 2010

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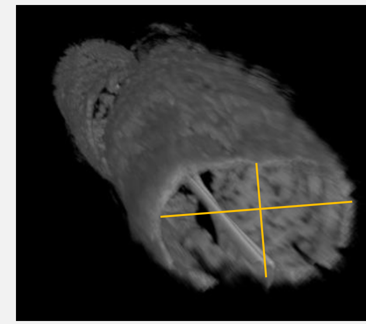
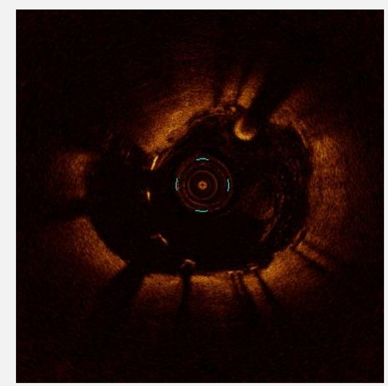
Topics: Quantifications

- Lumen and stent dimensions
  - excentricity



- Stent strut measurements
  - Malapposed struts
  - Jailing struts
  - Unapposed struts (instead of “floating” struts)



Layers and localization

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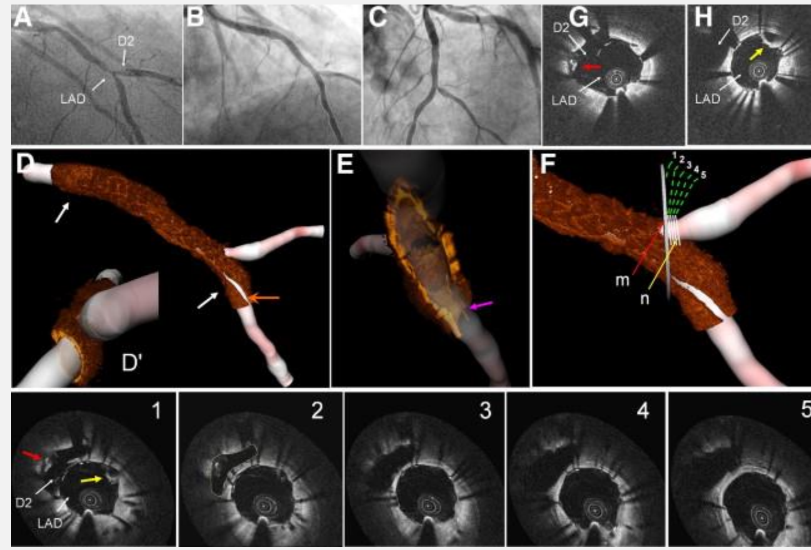
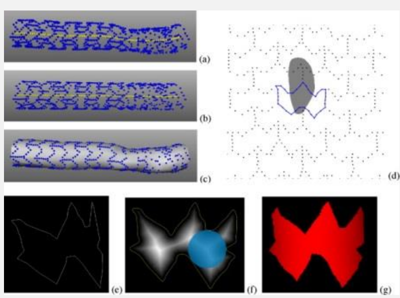
Topics: Advanced models

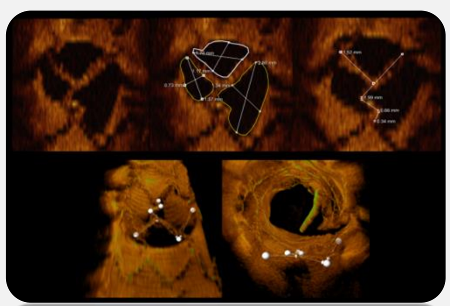
- 3D models
  - artifacts
- Advanced measurements



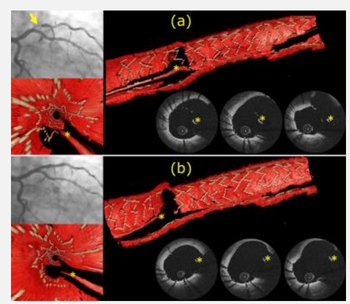
Tu et al. JACC Intv 2012



Wang et al. CMIG 2013



Holm et al. accepted EuroIntv.



Ughi et al. EHJ CI 2013

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Next step

- Final draft
- Formatting
- Discuss multi journal publication

- Revision
  - Consensus on standardized OCT measurements
  - Advanced measurements

  - Clinical guidelines

Please join

- e-mail:

Include relevant disclosures

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Tom Adriaenssens and Niels R. Holm

subcommittee organizers