



Washington
Hospital Center



Integrated CT Modalities in Interventional Cardiology

TCTAP 2012

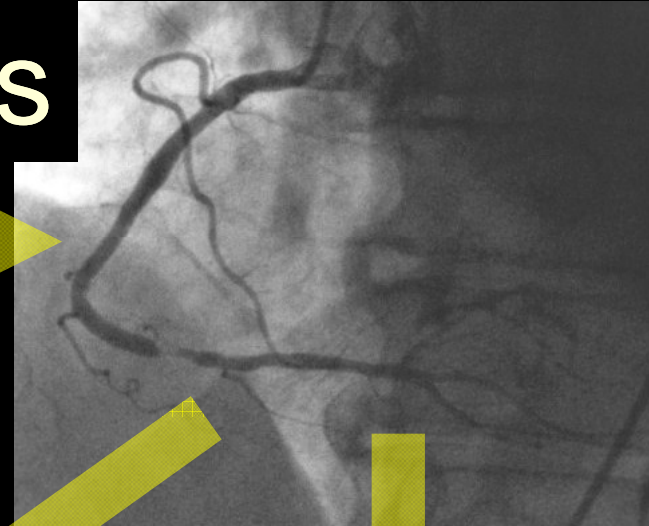
Seoul, Korea

Wm. Guy Weigold, MD, FACC, FSCCT
Director, Cardiac CT Program
Washington Hospital Center
Washington, DC

Traditional Approach to CAD



Diagnosis



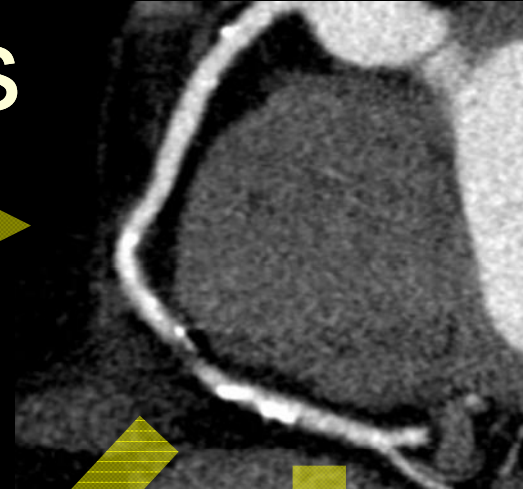
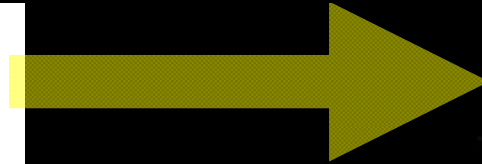
Intervention

No
Intervention

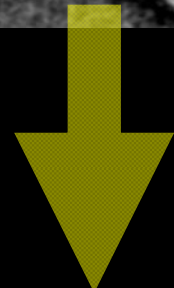
21st Century Approach to CAD



Diagnosis



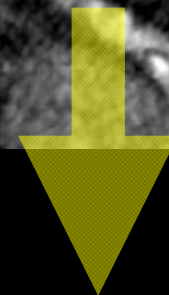
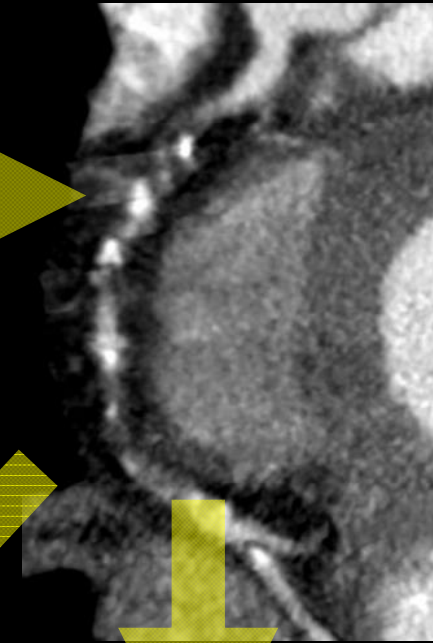
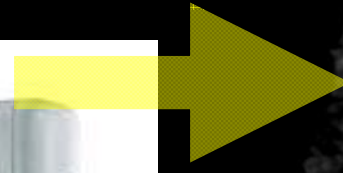
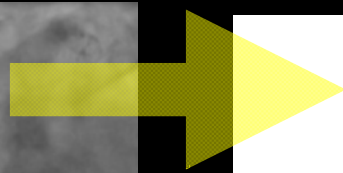
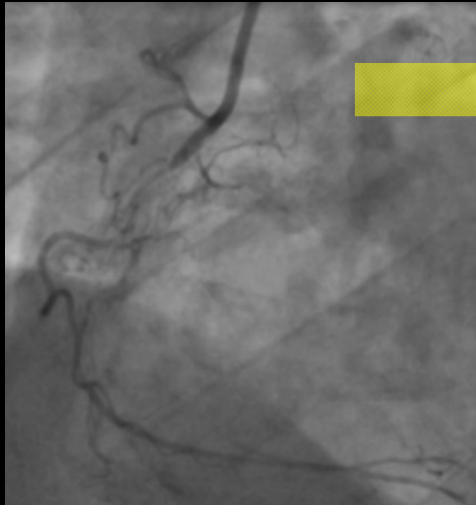
Intervention



No
Intervention

21st Century Approach: CTO

Diagnosis Evaluation



No
Intervention

Angiographic Variables Related to Success of CTO PCI

- Discrete lesion / Long lesion

These Characteristics Can Also Be Evaluated by 3D Coronary CTA

- Calcification
- Side branch presence / location

Limitations of Traditional Coronary Angiography

Requires invasive
study

“Lumenogram”

Plaque
characterization
requires IVUS

Projection images
(vessel overlap and
foreshortening)

Multiple injections
& runs for optimal
viewing angle

Coronary CTA Provides Unique Perspective

Non-invasive

**3D Volume of
Anatomic Data
(No Overlap)**

**Plaque
characterization
(calcification)**

**Volume Data Can
Be Infinitely
Manipulated**

How Coronary CTA is Interpreted & Utilized

Lesion Length

Lesion Curvature

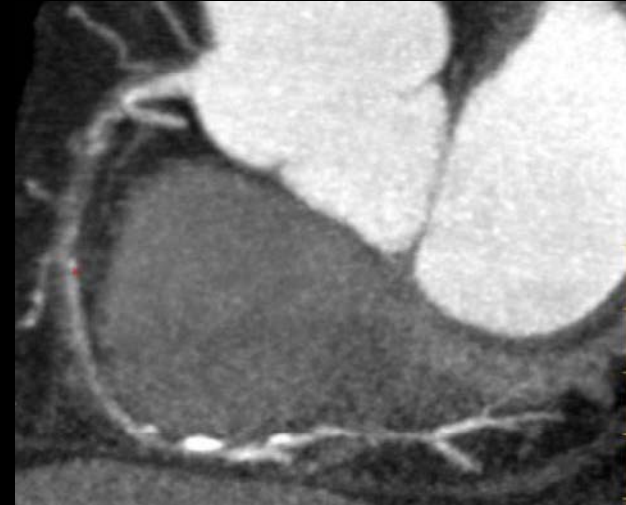
Lesion Access

Side Branch Locations

S.B. Origin Angle

Distal Vessel Caliber

CTO Plaque Character



Angiographic and MSCT Predictors of Procedural Failure

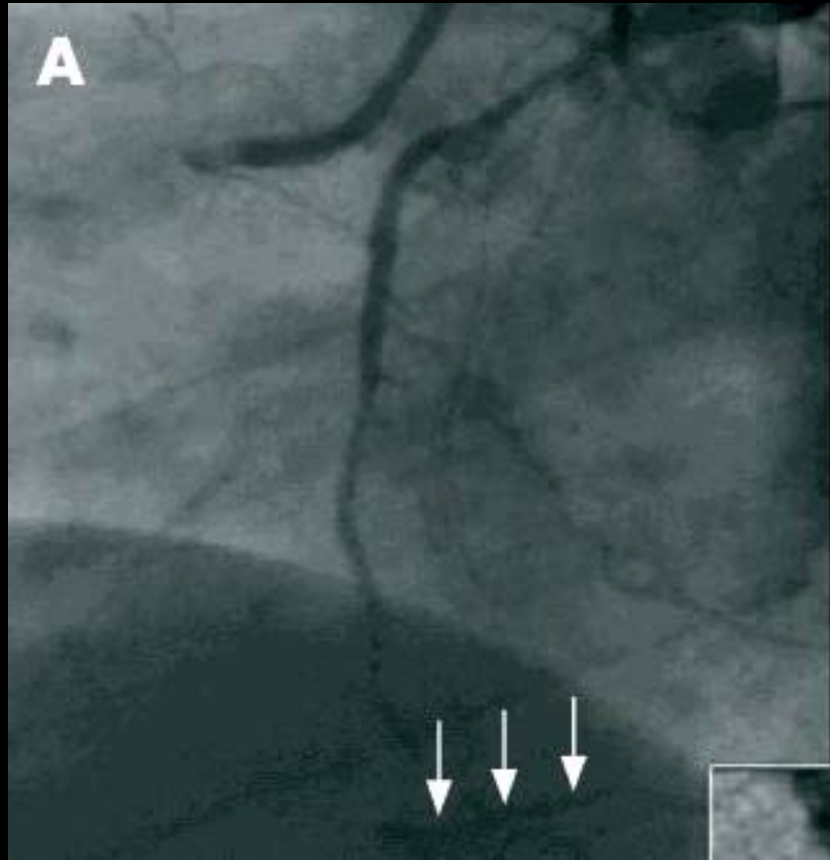
Variable	OR (95% CI)
Tapered stump (angio)	0.09 (0.02-0.48) P < 0.01
Occlusion length >15mm (MSCT)	8.77 (1.58-48.76) P = 0.01
Severe calcification (MSCT)	7.62 (1.33-43.74) P = 0.02

Dense Calcification Predicts Failure

39 pts with 43 CTO
56% successful revascularization overall

Variable	OR (95% CI)
Dense calcification (>50% cross sectional area)	0.10 (0.02 - 0.47)
Blunt stump	0.24 (0.07-0.86)

50 yo man with angina



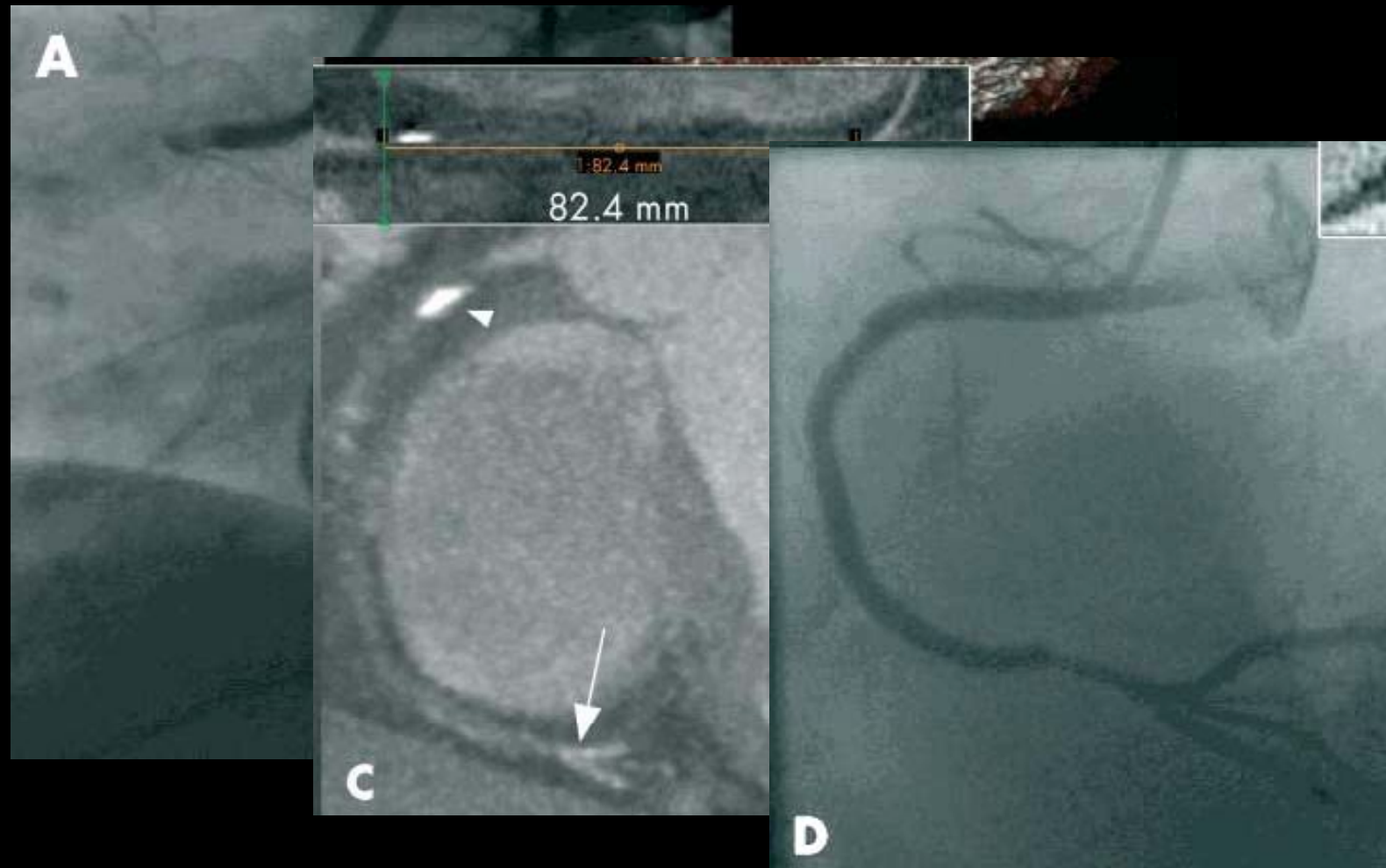
Van Mieghem CAG, van der Ent M, de Feyter PJ. PCI for CTO. Value of preprocedure MSCT guidance. *Heart* 2007;93:1492

50 yo man with angina



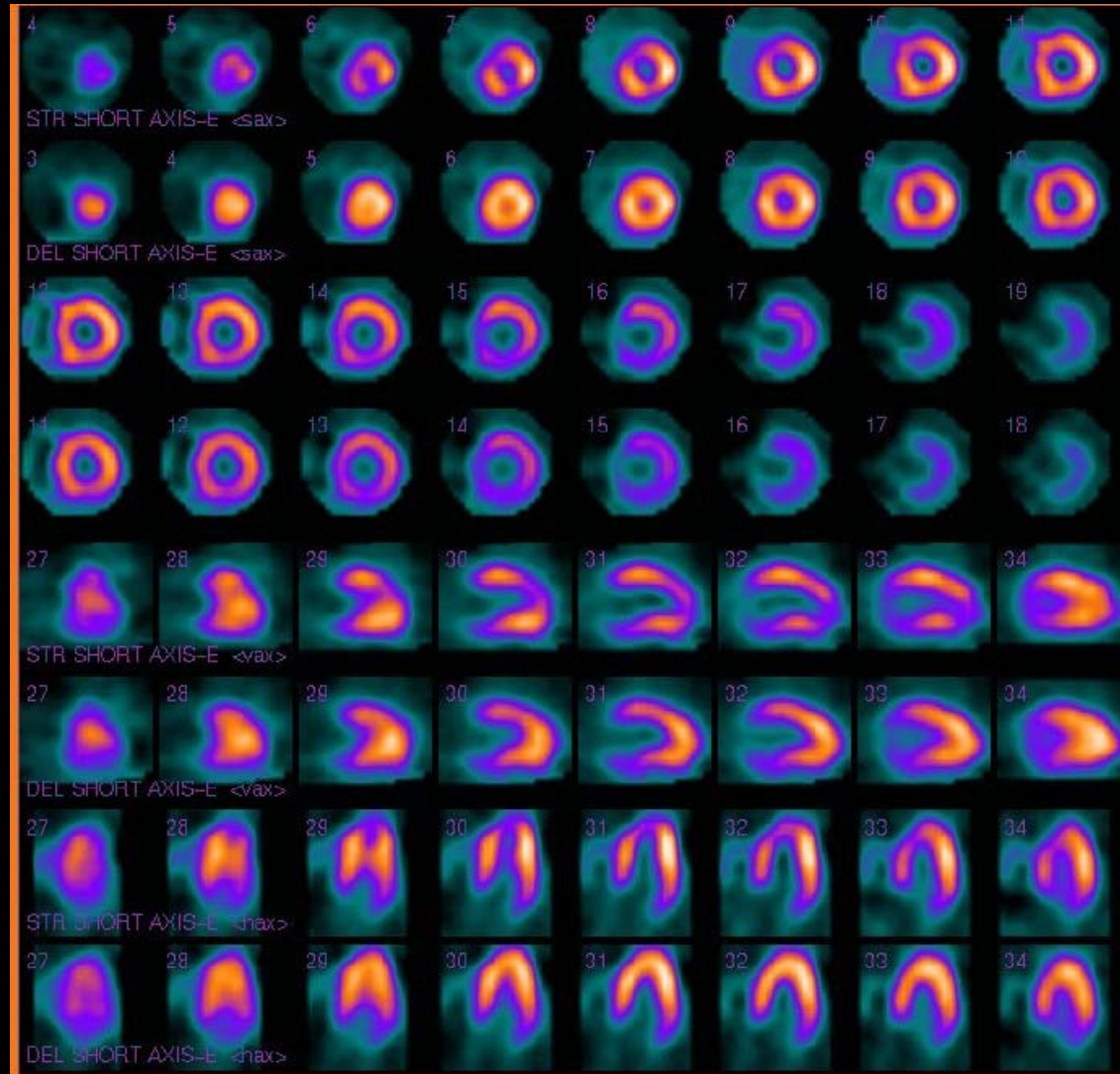
Van Mieghem CAG, van der Ent M, de Feyter PJ. PCI for CTO. Value of preprocedure MSCT guidance. *Heart* 2007;93:1492

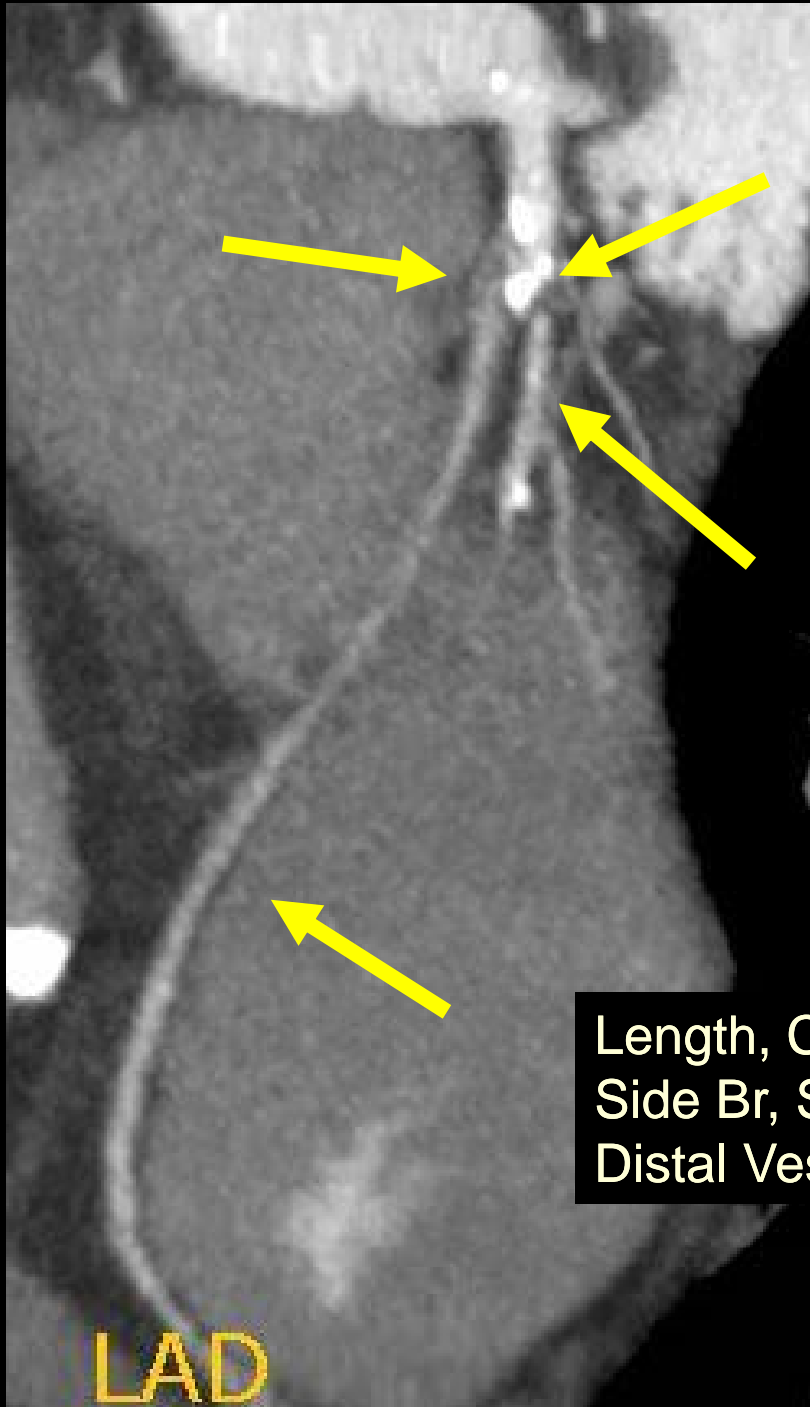
50 yo man with angina



Van Mieghem CAG, van der Ent M, de Feyter PJ. PCI for CTO. Value of preprocedure MSCT guidance. *Heart* 2007;93:1492

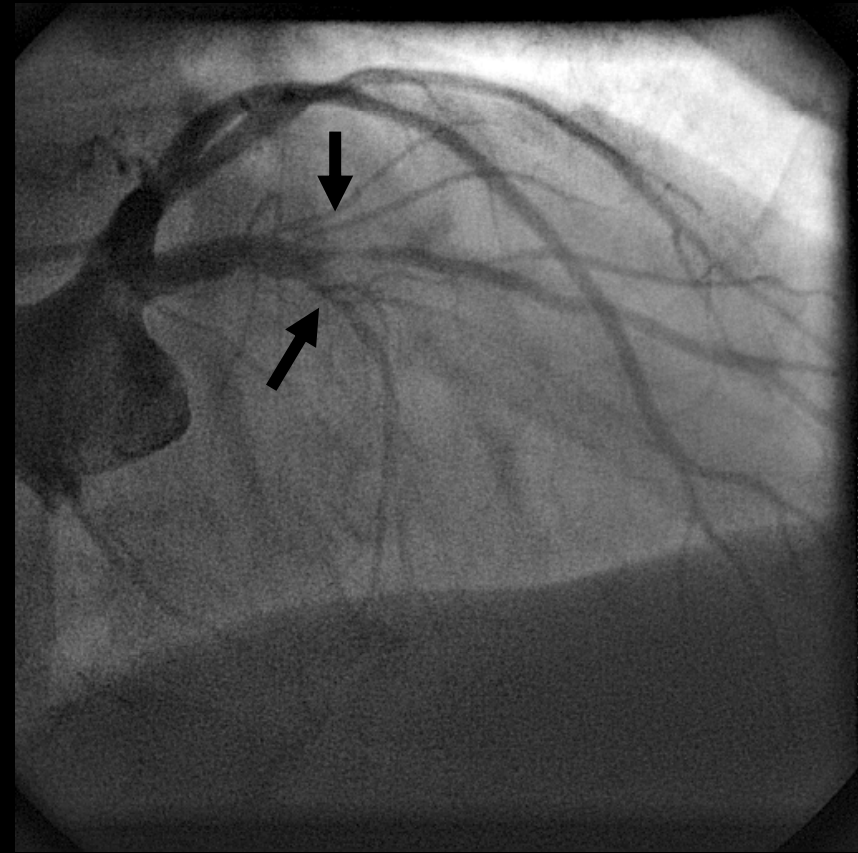
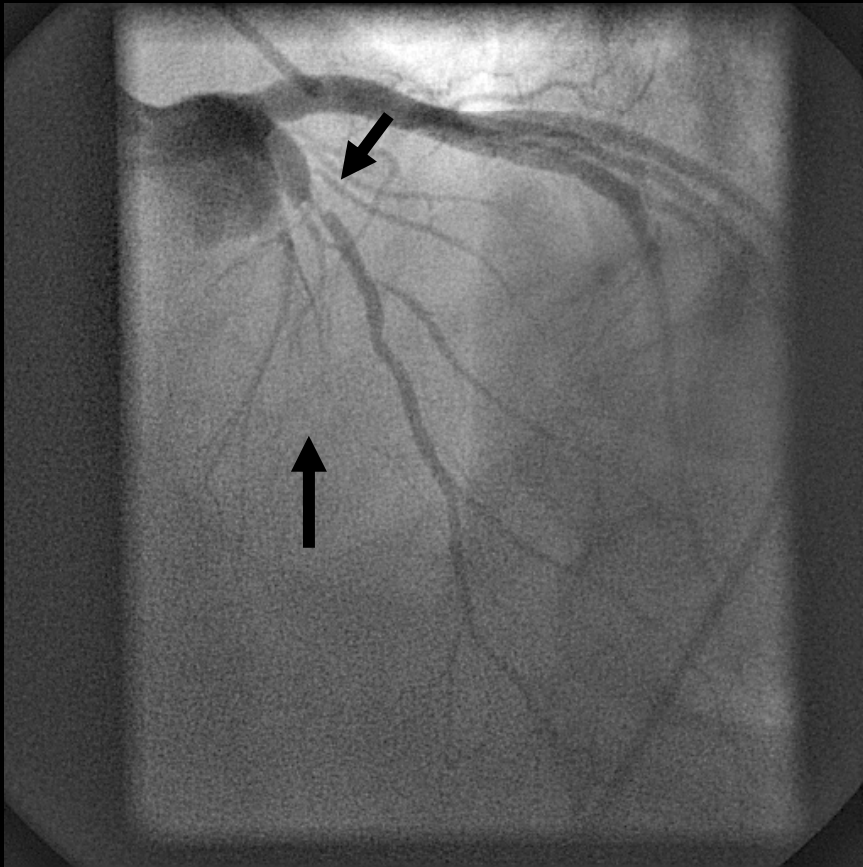
65 yo physician



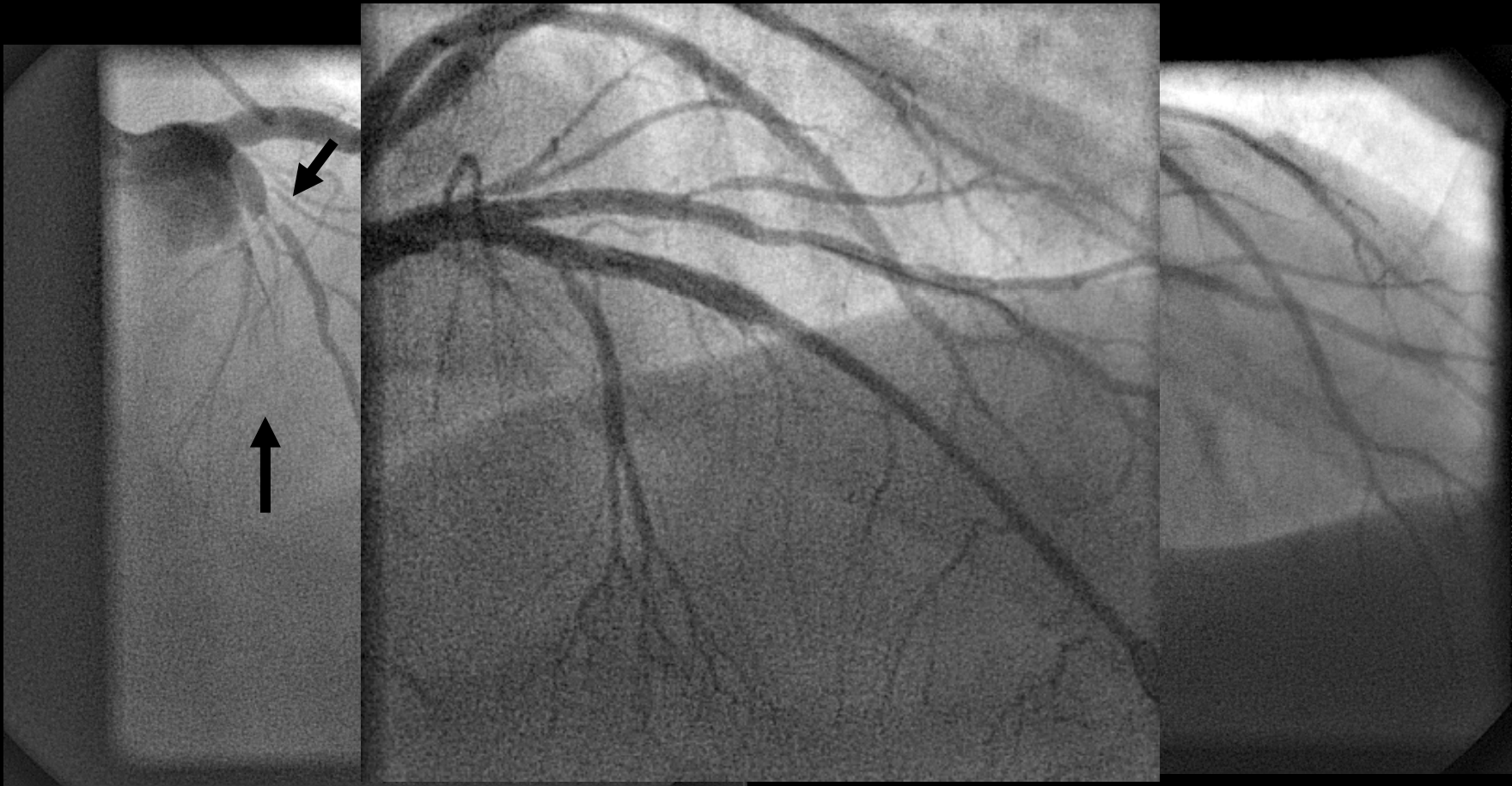


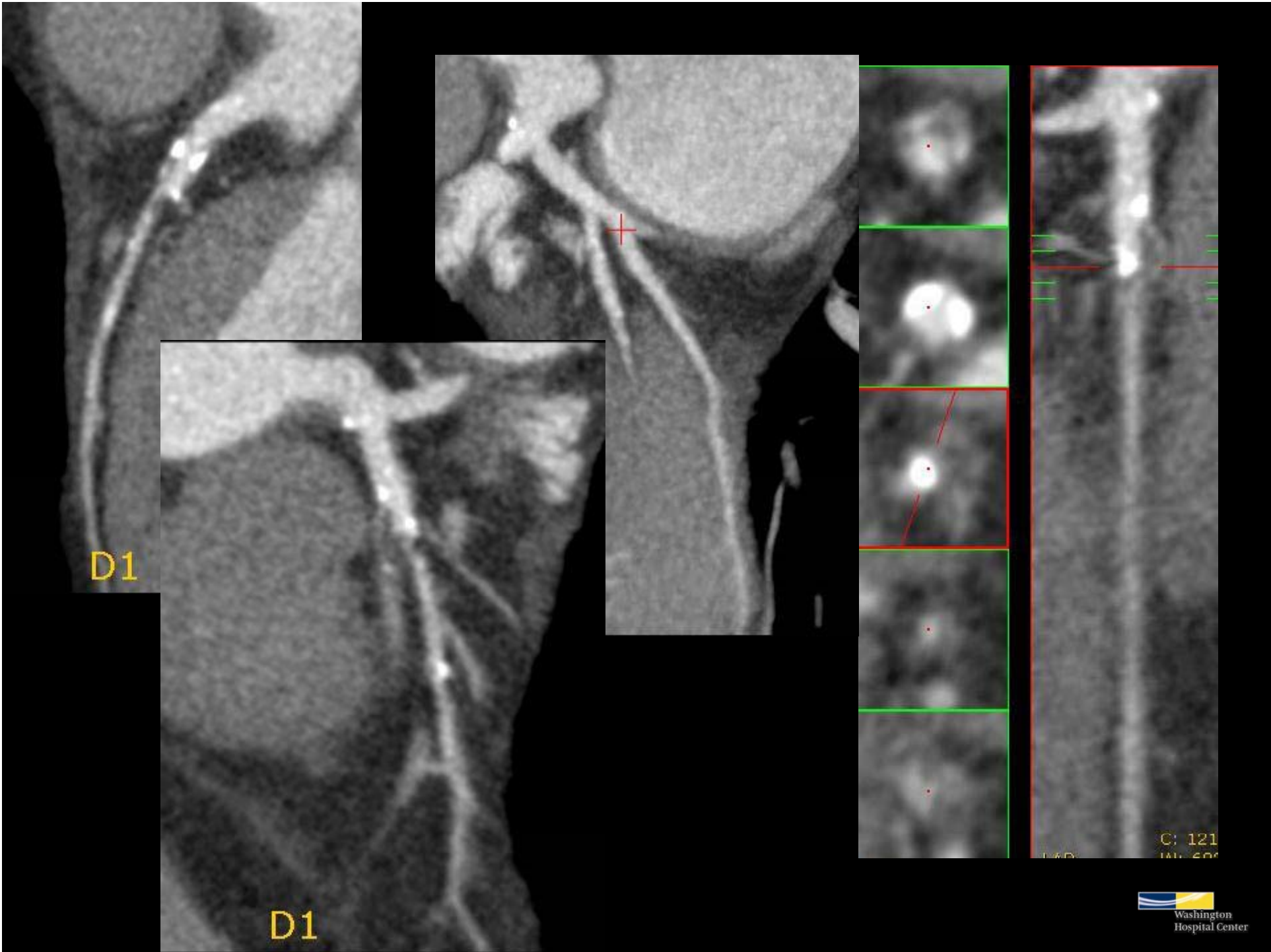
Length, Calcification,
Side Br, SB Angle,
Distal Vessel

LAD & Diagonal

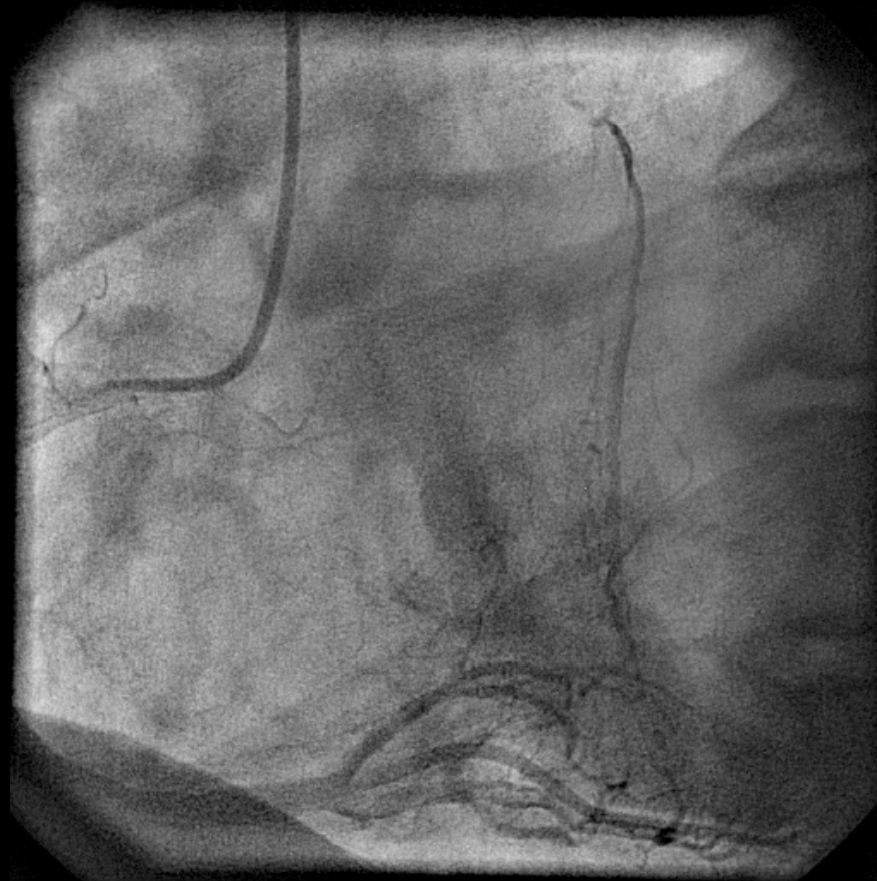
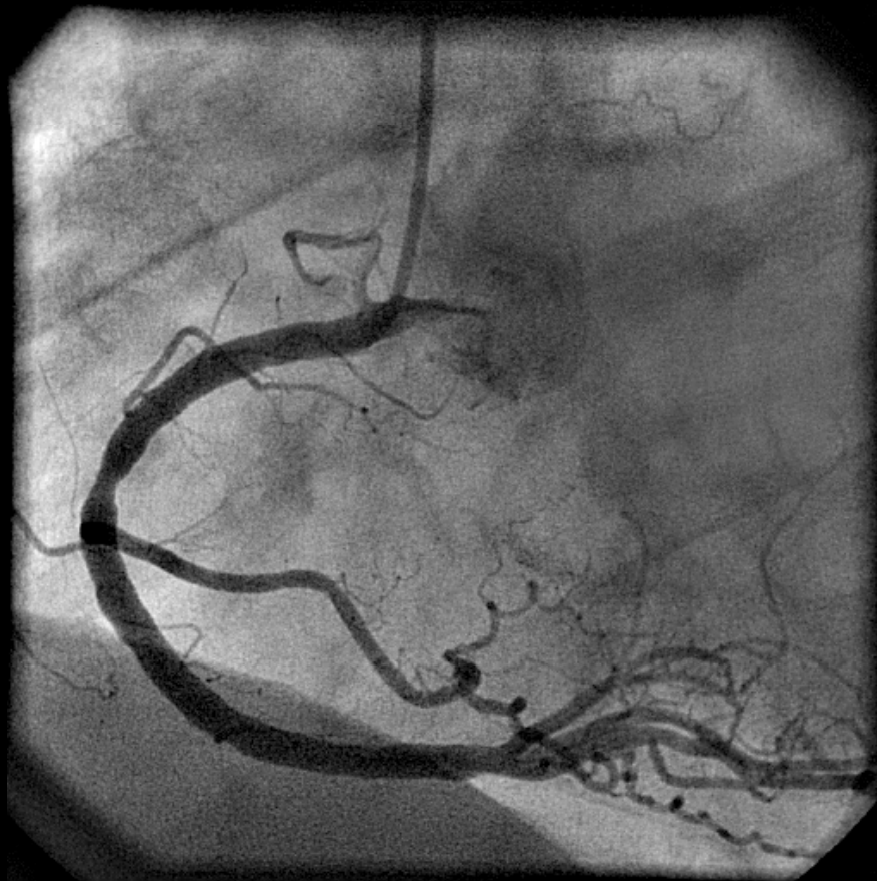


LAD & Diagonal

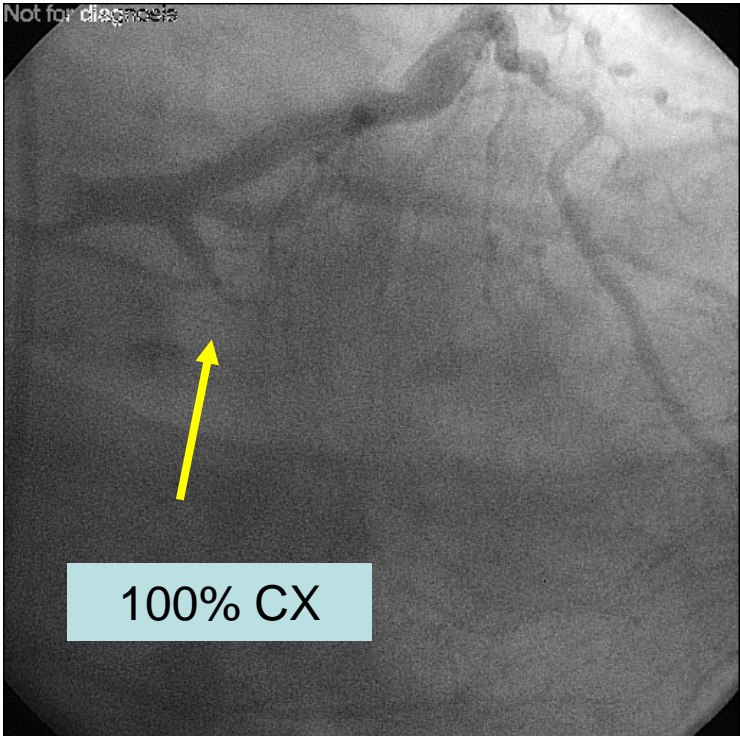




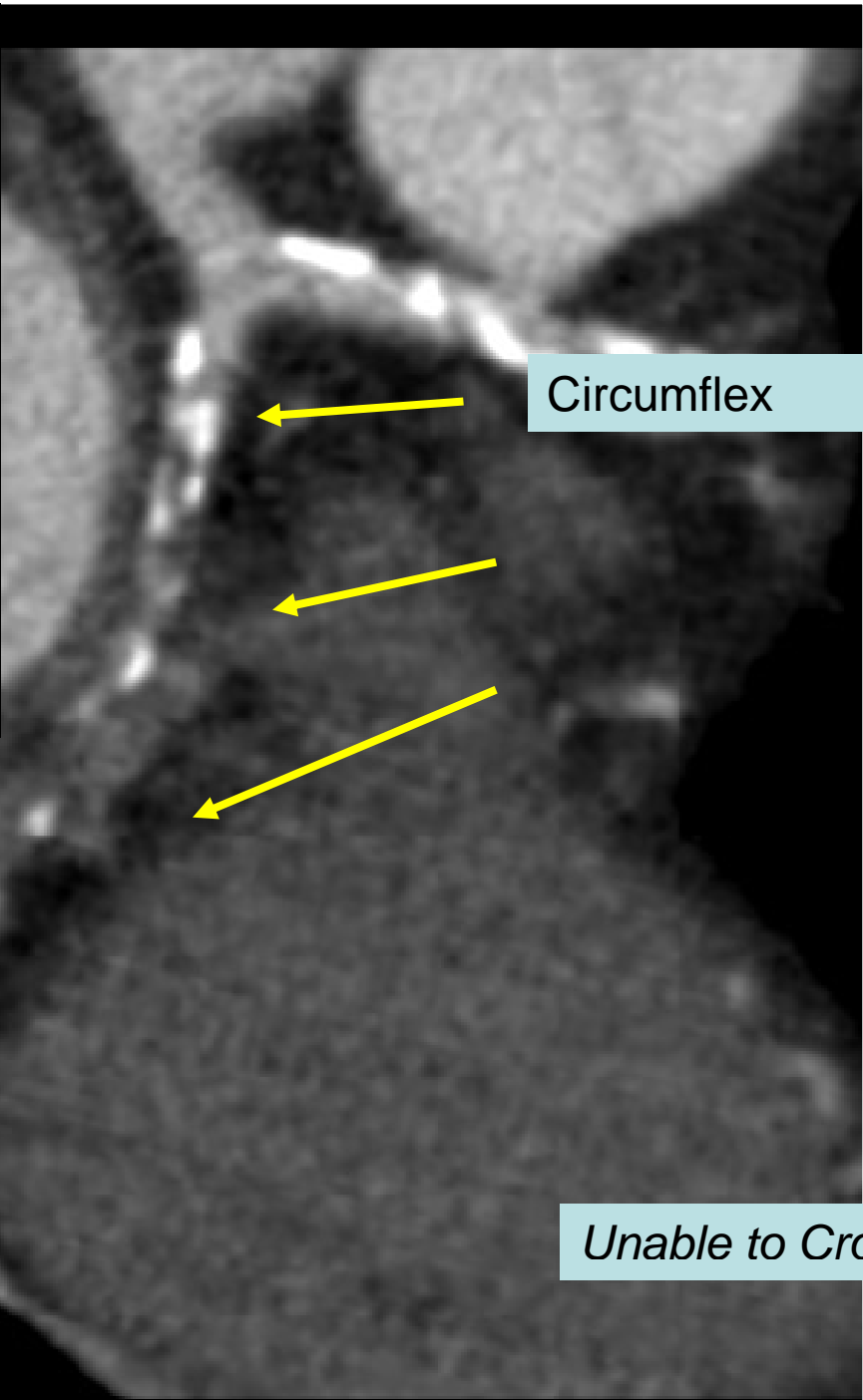
RCA



Not for diagnosis

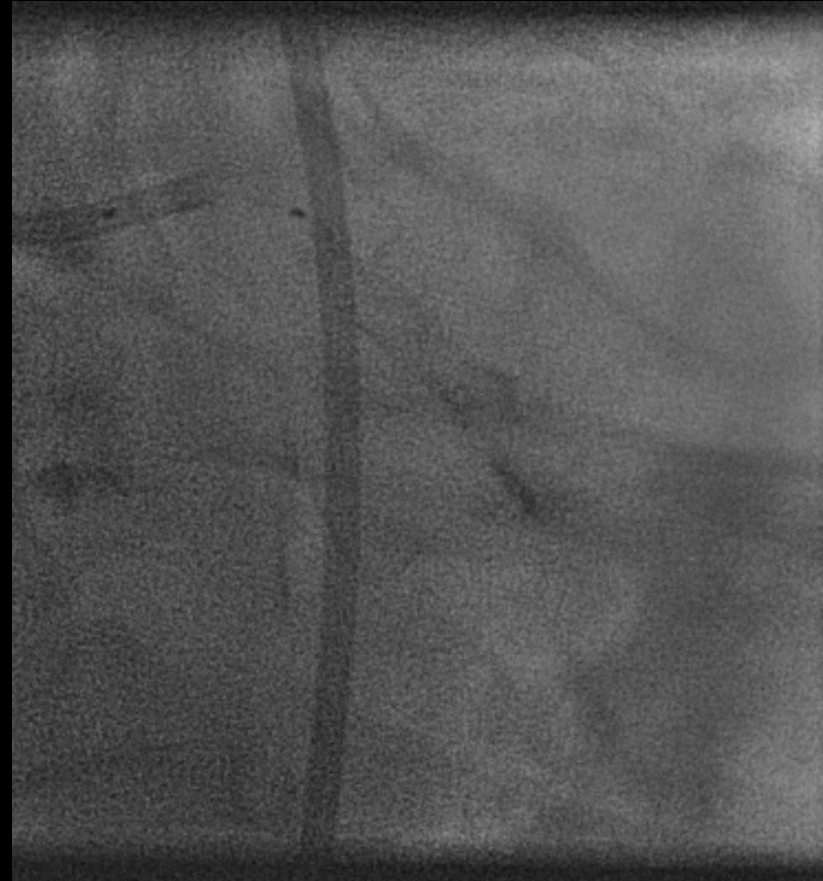
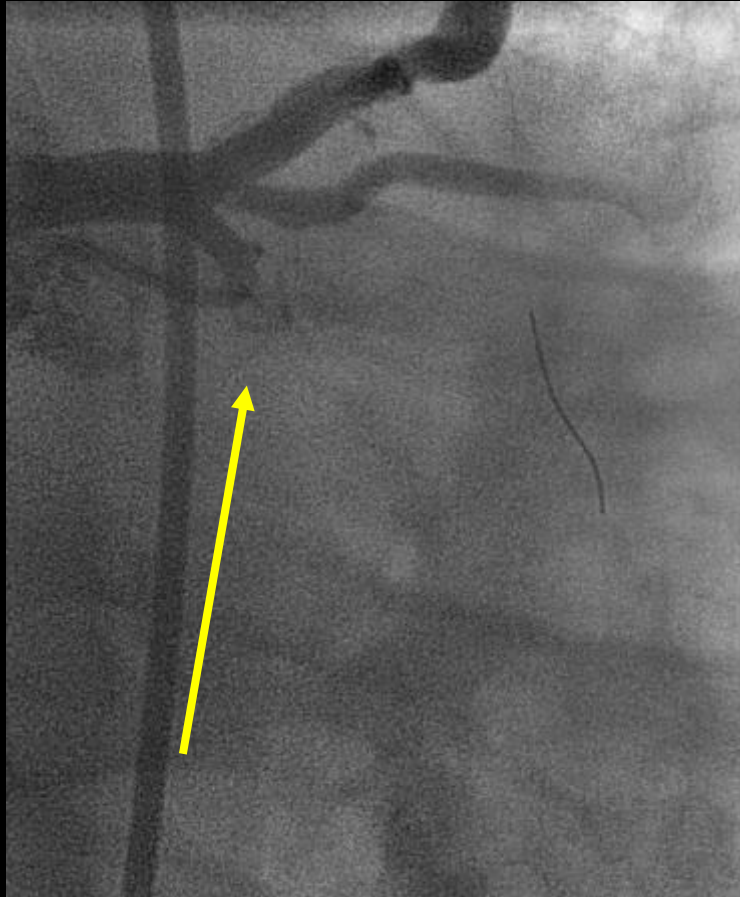


100% CX



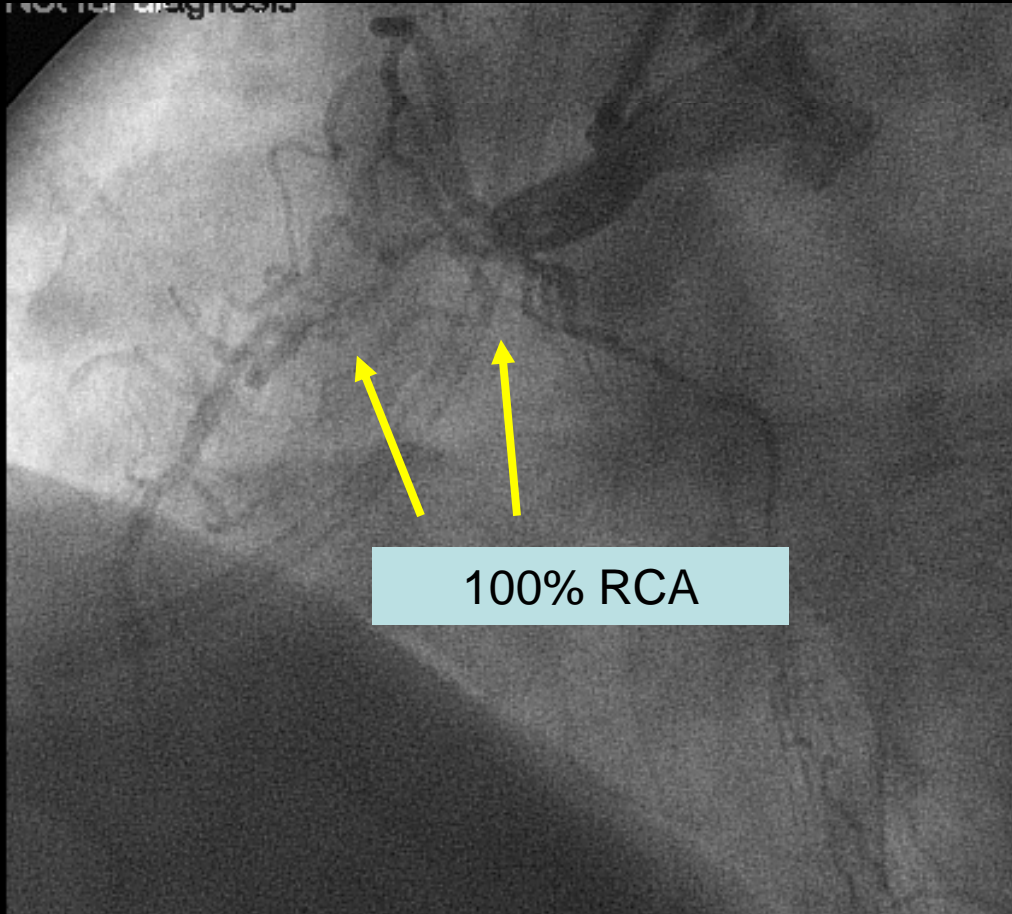
Circumflex

Unable to Cross



CX after partial wire crossing

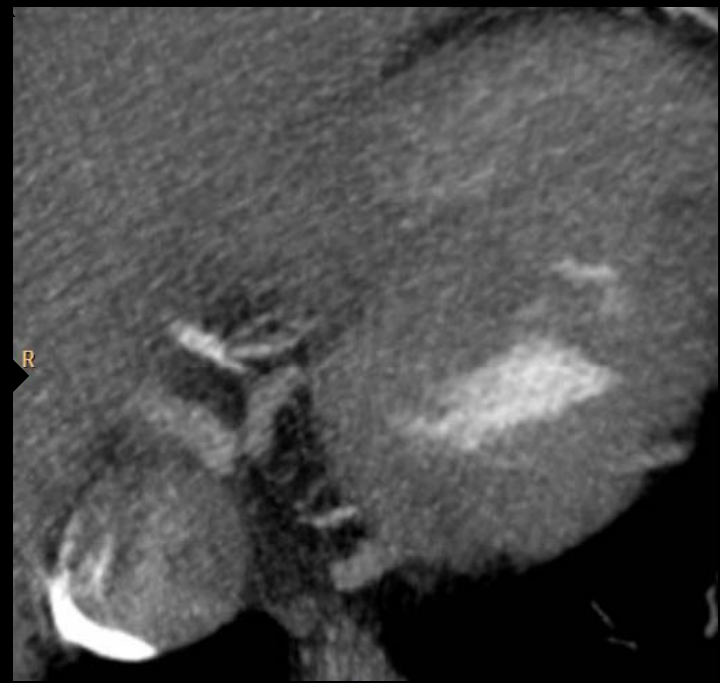
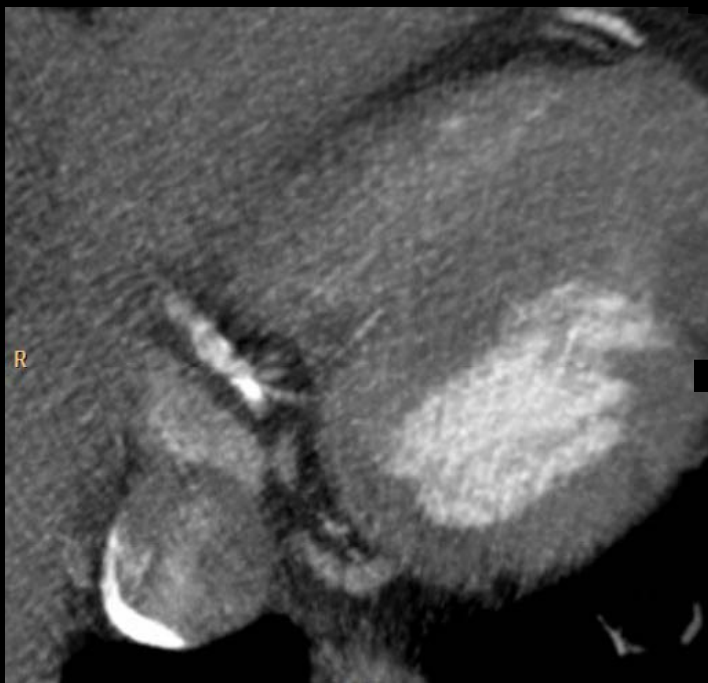
Not for diagnosis

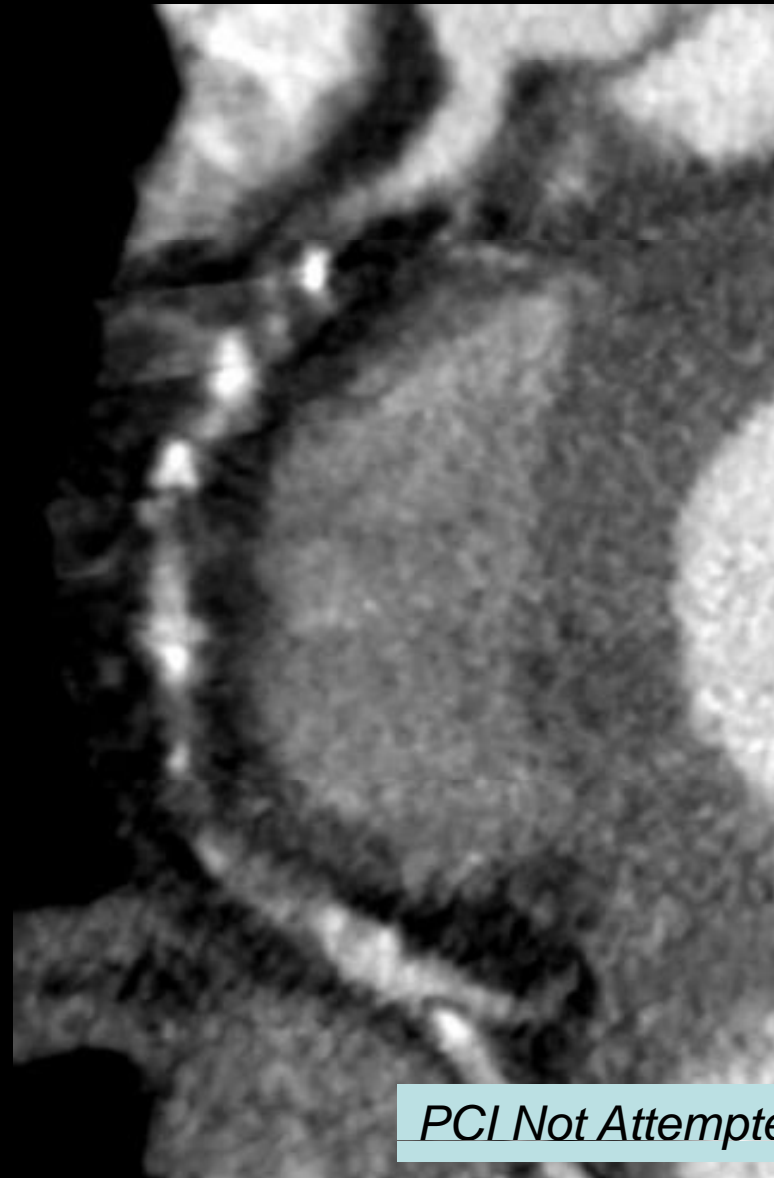


100% RCA









TrueView



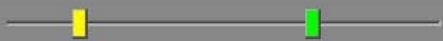
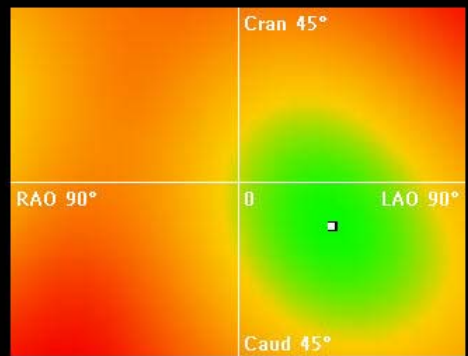
Analyse a subsegment by dragging the controls on the slider or by dragging the rings on the image of the model.

TrueLength TrueView Views

Current Foreshortening: 1.9 %

Minimum Foreshortening: 1.9 %

LAO 38° Caud 11°



Swap

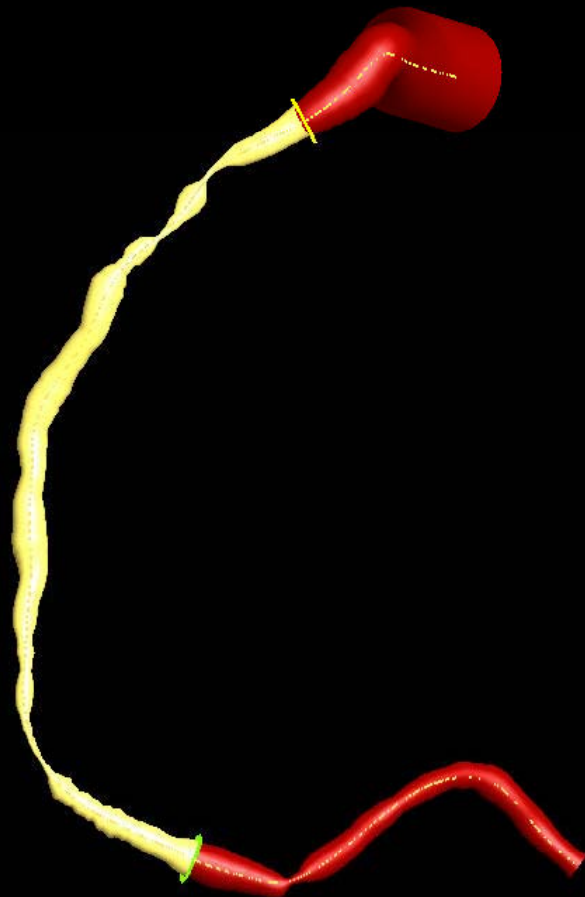
Settings

LAO 37°

Caud 11°



Exit



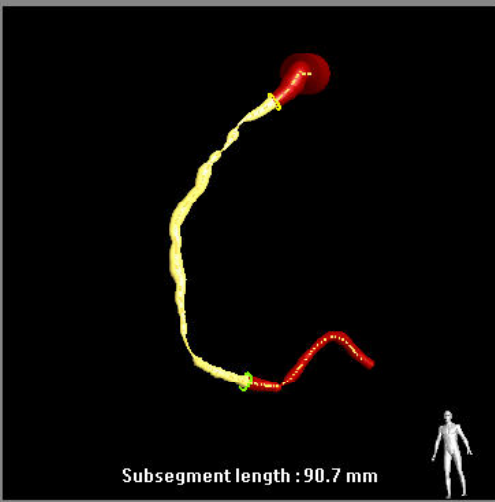
Subsegment length : 90.7 mm



TrueView

Analyse a subsegment by dragging the controls on the slider or by dragging the rings on the image of the model.

TrueLength TrueView Views

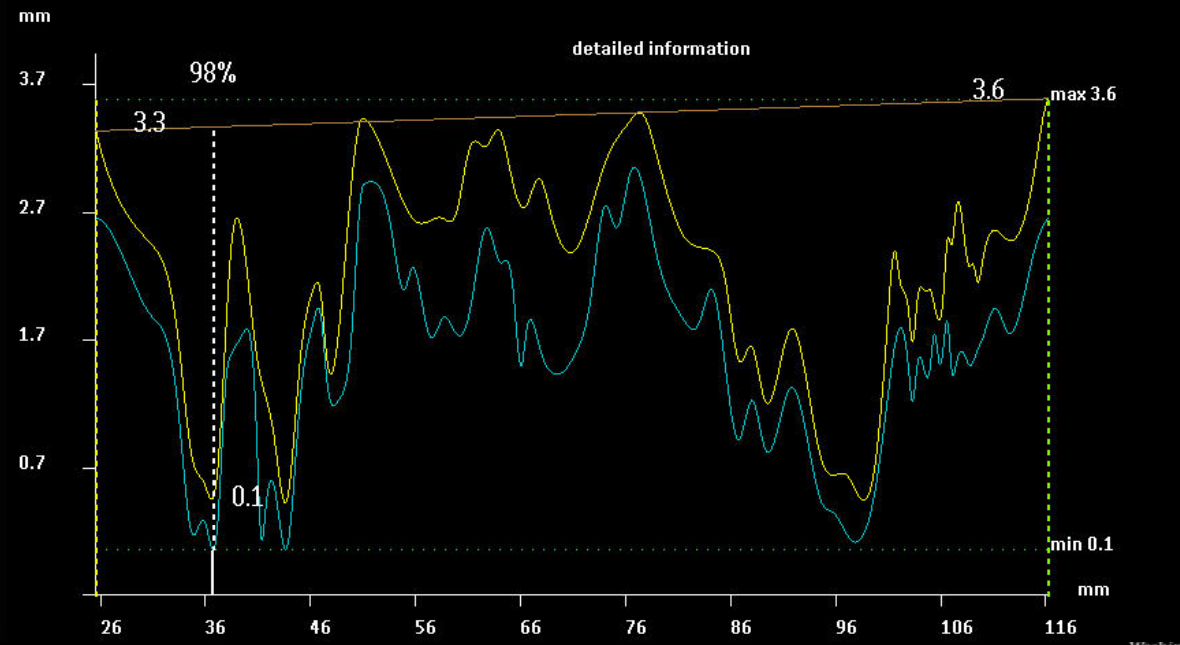
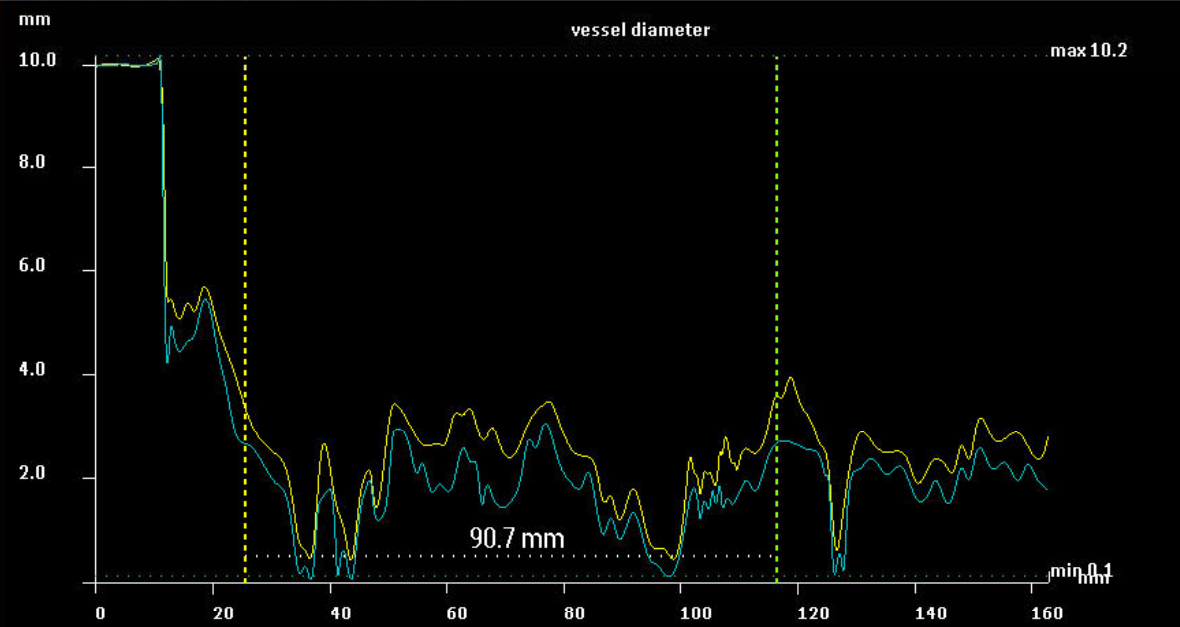
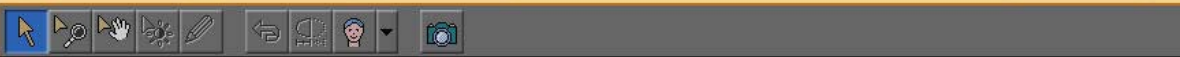


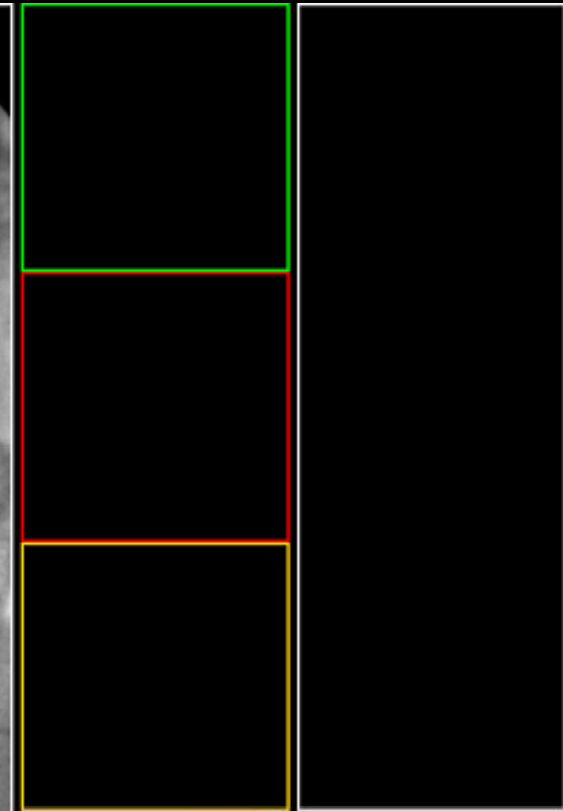
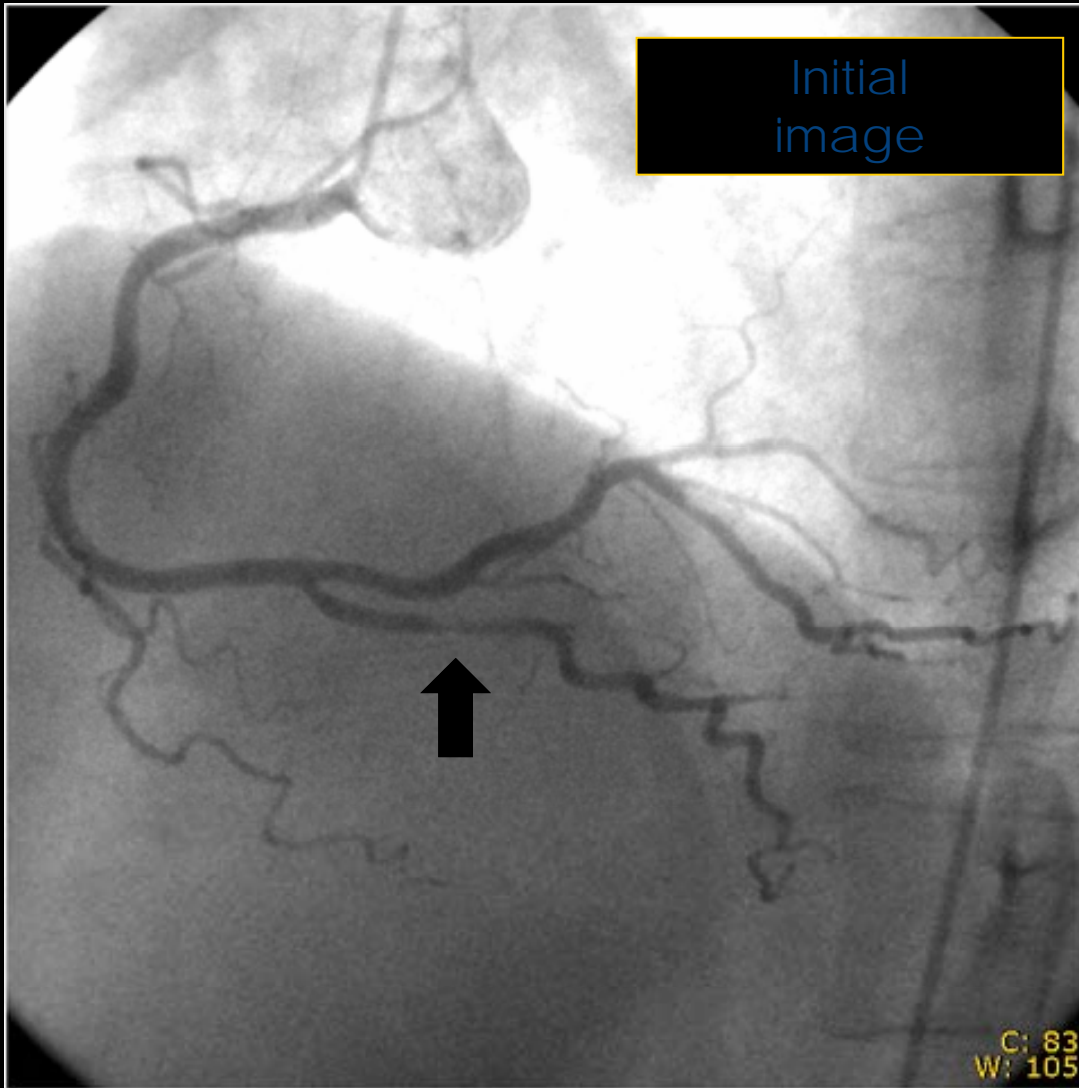
Effective Diameter Minimum Diameter Swap

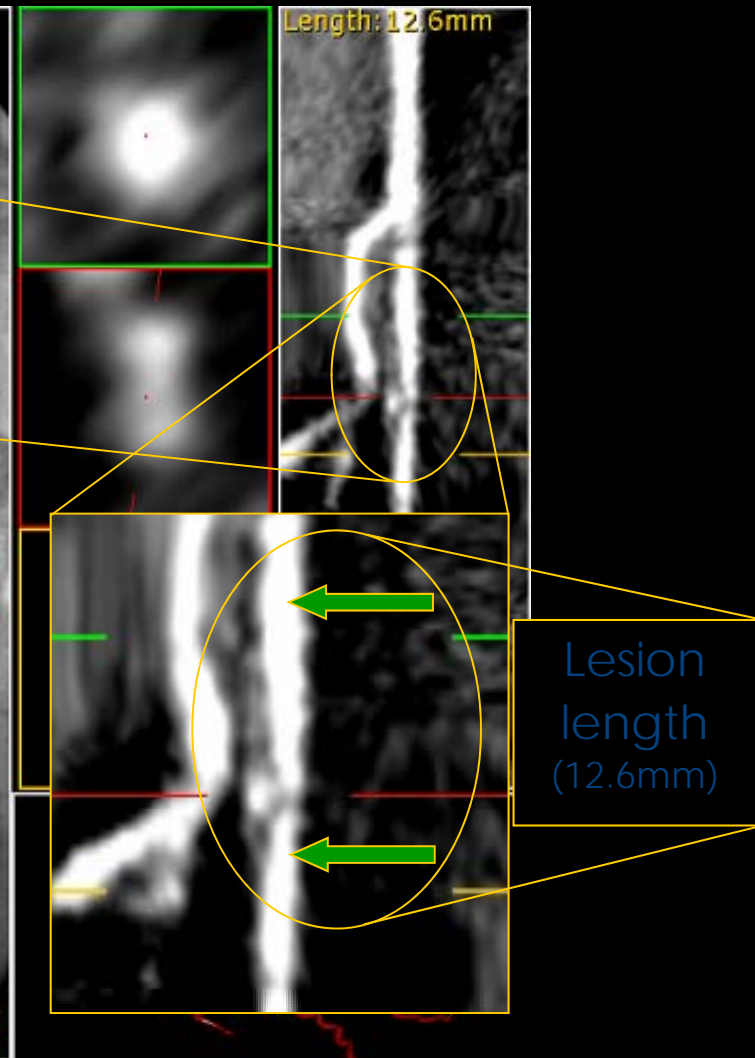
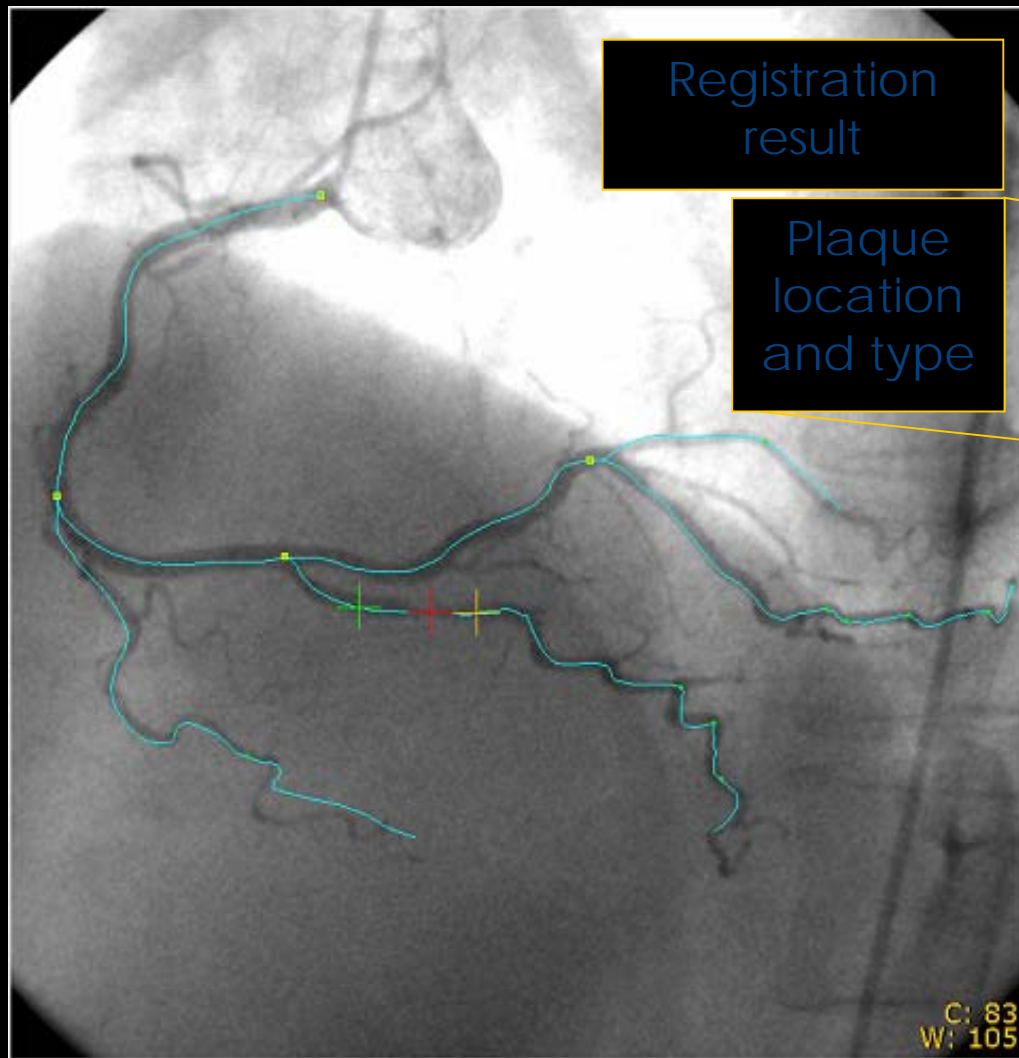
Settings

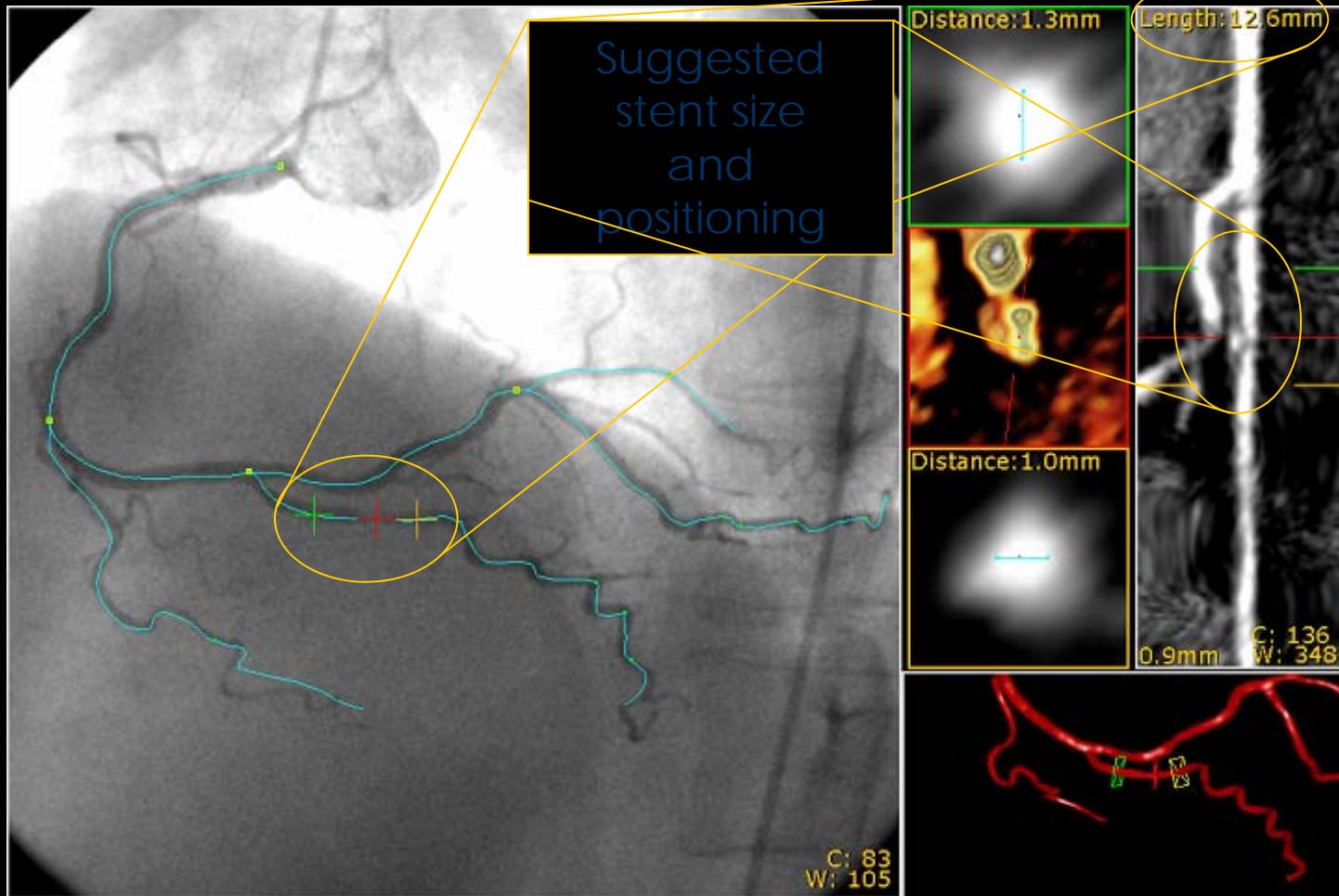
LAO 16°
Caud 3°

Exit



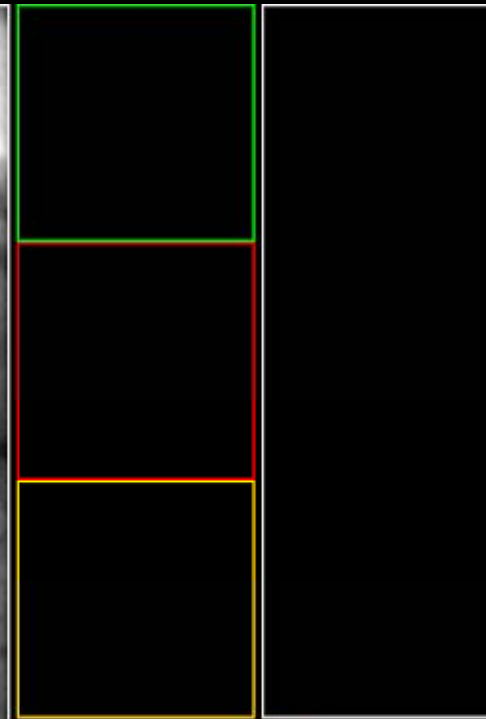
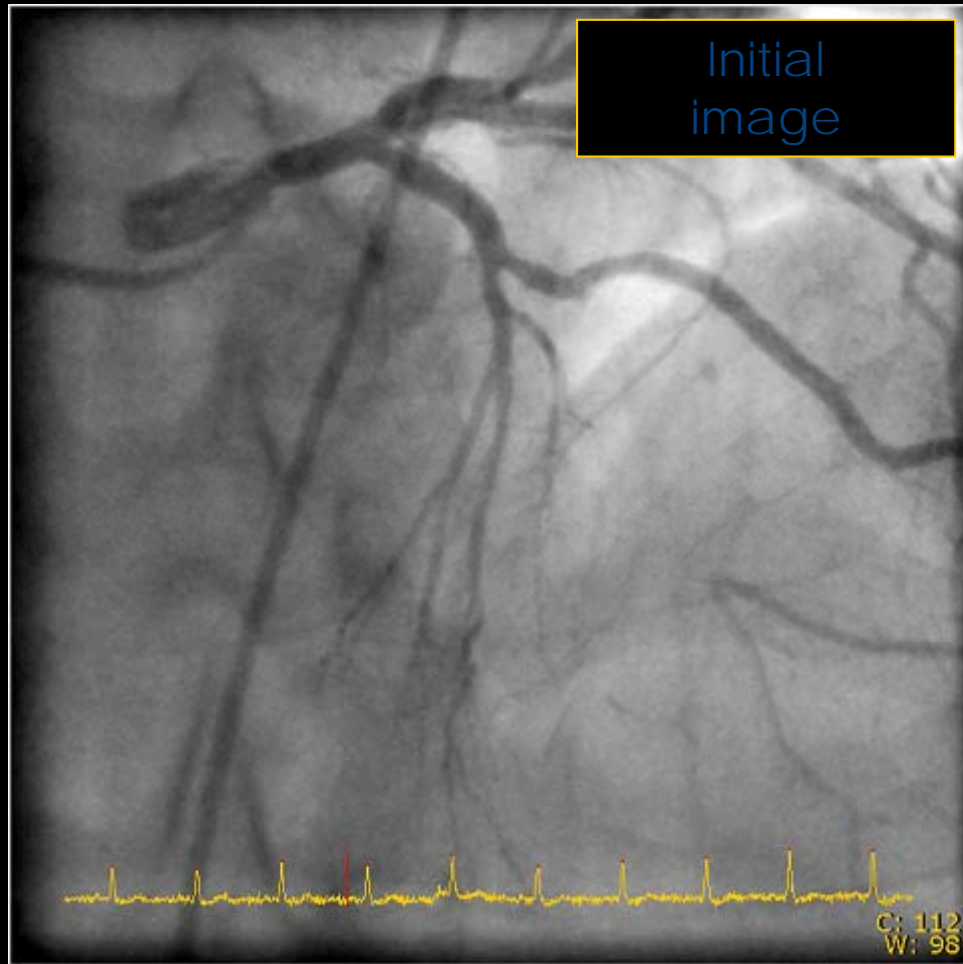


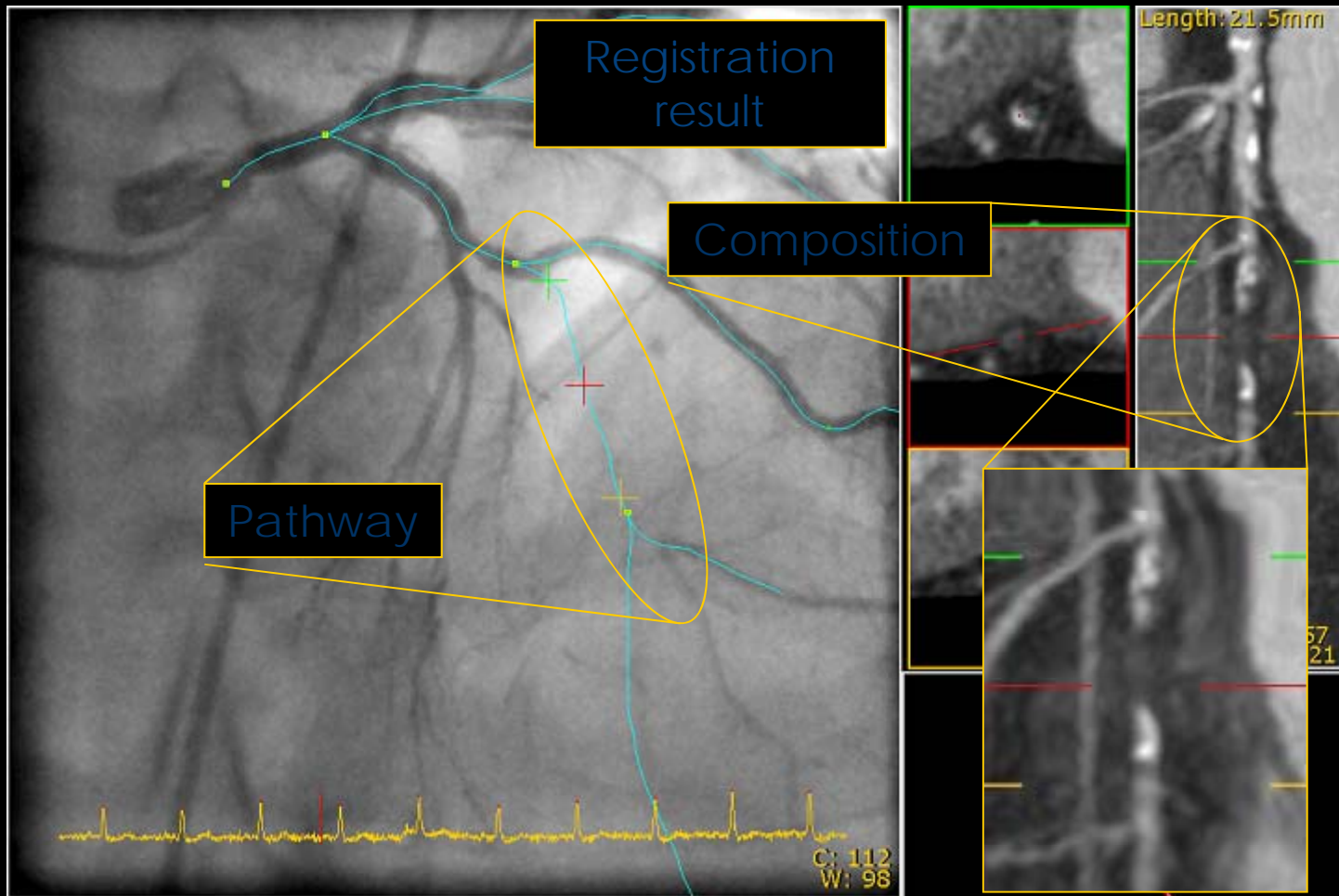




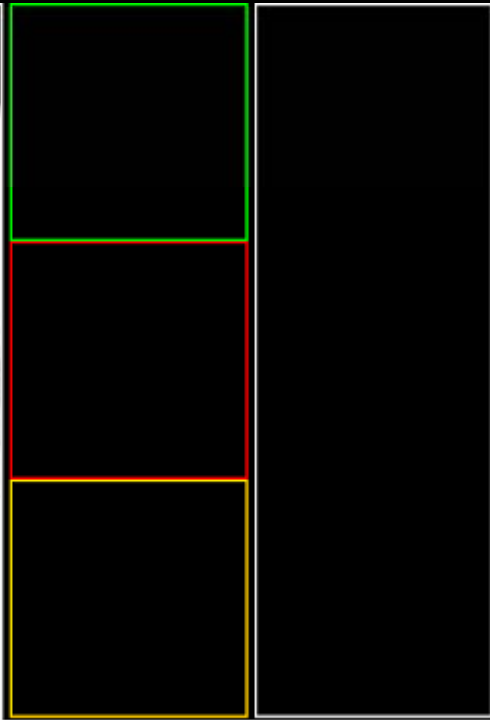
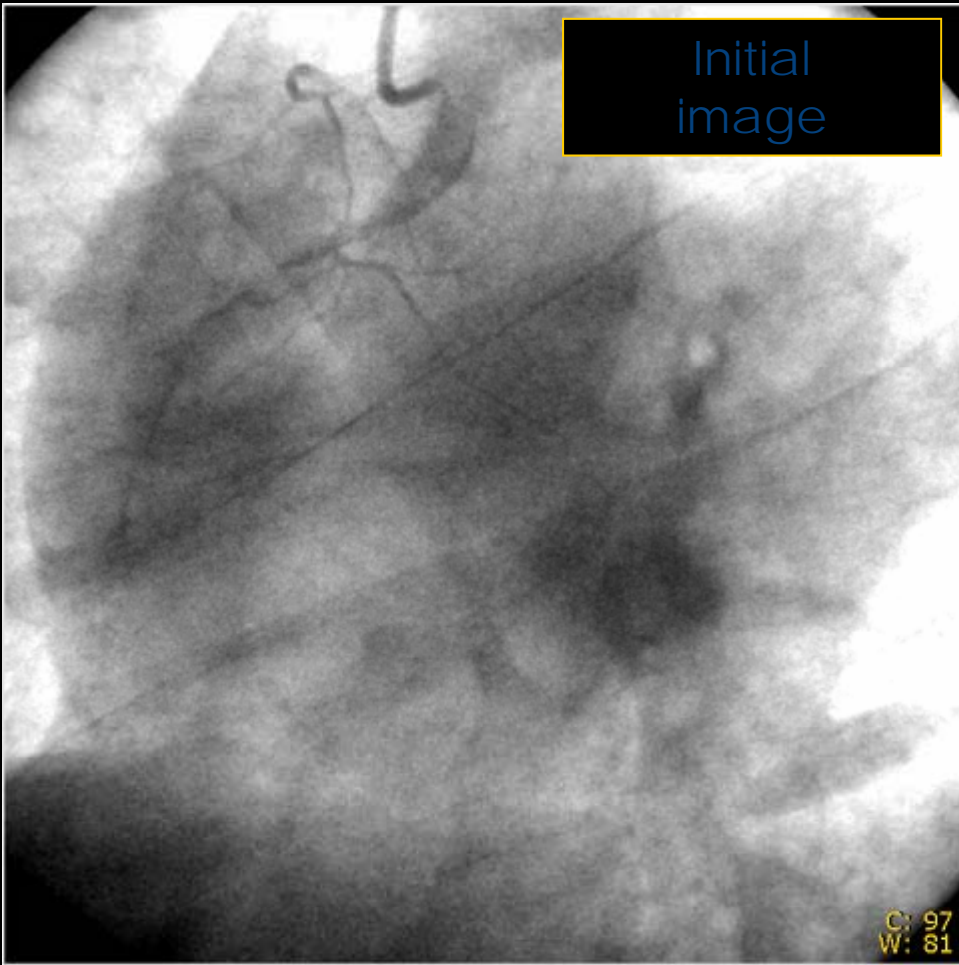
Courtesy Shina Systems

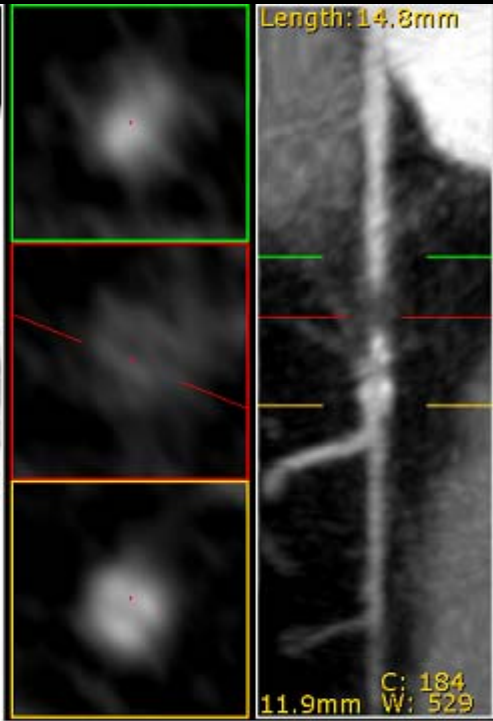
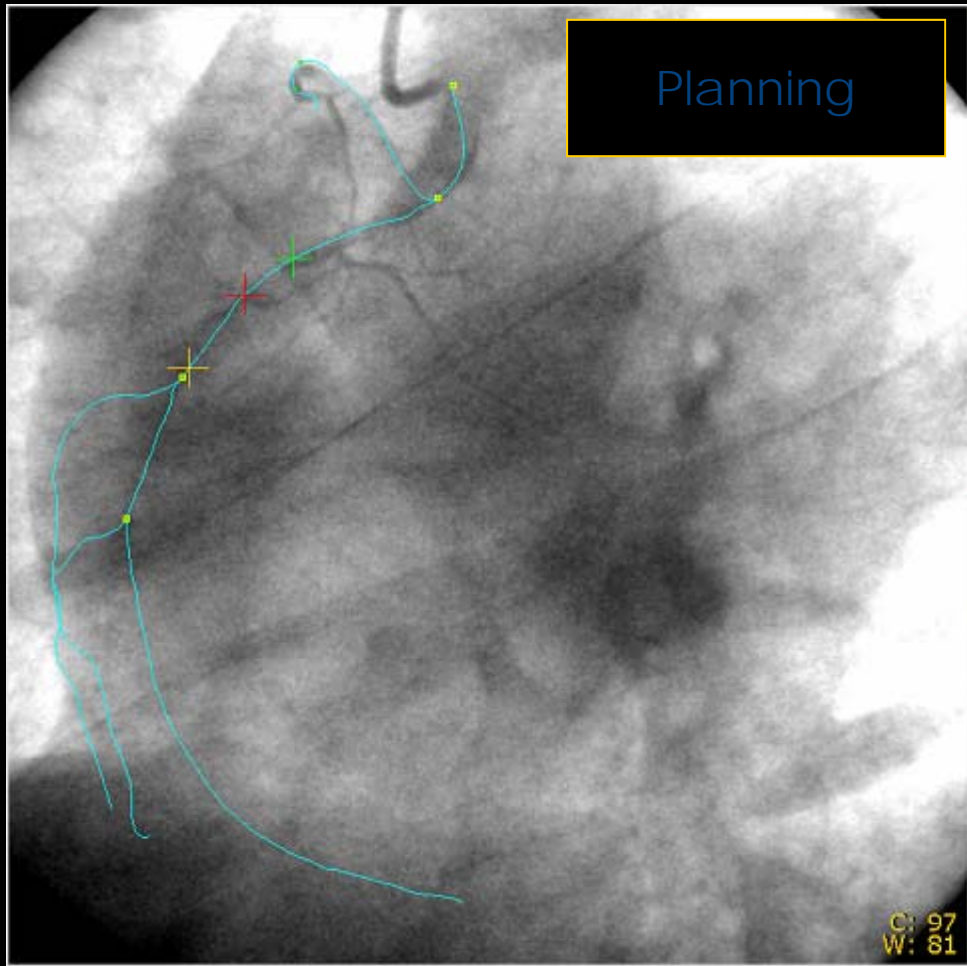


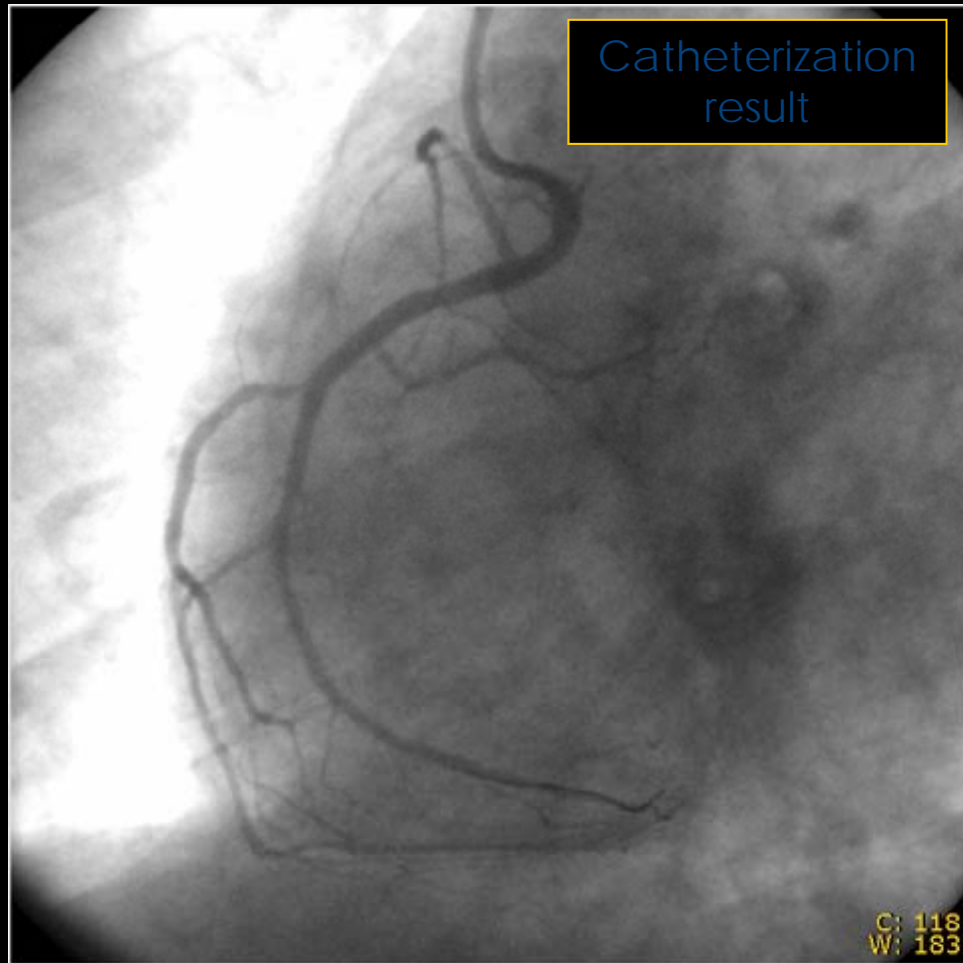




Courtesy Shina Systems







Courtesy Shina Systems

Conclusions

- Coronary CTA is highly sensitive for the detection of CAD & stenosis
- Beyond diagnosis, Cor CTA may provide information useful for the planning of PCI
- Especially in PCI of CTO, the ability to visualize the plaque and the distal vessel will prove useful in planning the intervention
- The goals:
 - Improve patient selection
 - Decrease time, contrast, complications in the lab
 - Improve patient outcomes