

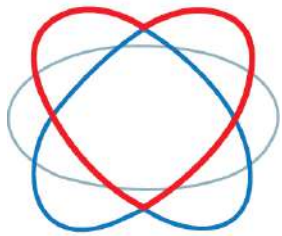
# Analyser et optimiser les angioplasties de CTOs:

## Apport de l'IVUS HD

**Nicolas Boudou**

**Clinique Saint Augustin**

**Bordeaux**



Cardiologie Médicale  
et Interventionnelle  
**SAINT-AUGUSTIN**

# Conflicts d'intérêt

Speaker's name: Dr Nicolas Boudou

- ☑ CTO proctoring: Asahi, Terumo
- ☑ FORM A: score 2
- ☑ FORM B: score 2

I.		II.		III.		IV.	
I have received (a) research grant(s) / in kind support		I have been a speaker or participant in accredited CME/CPD ...		I have been a consultant / strategic advisor etc. ...		I am a holder of (a) patent / shares / stocks or ownership...	
A		A		A		A	
... from current sponsor(s)		... from current sponsor(s)		... for current sponsor(s)		... related to presentation	
YES	NO	YES	NO	YES	NO	YES	NO
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B		B		B		B	
... from any institution		... from any institution		... for any institution		... not related to presentation	
YES	NO	YES	NO	YES	NO	YES	NO
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**SCORE: 2**



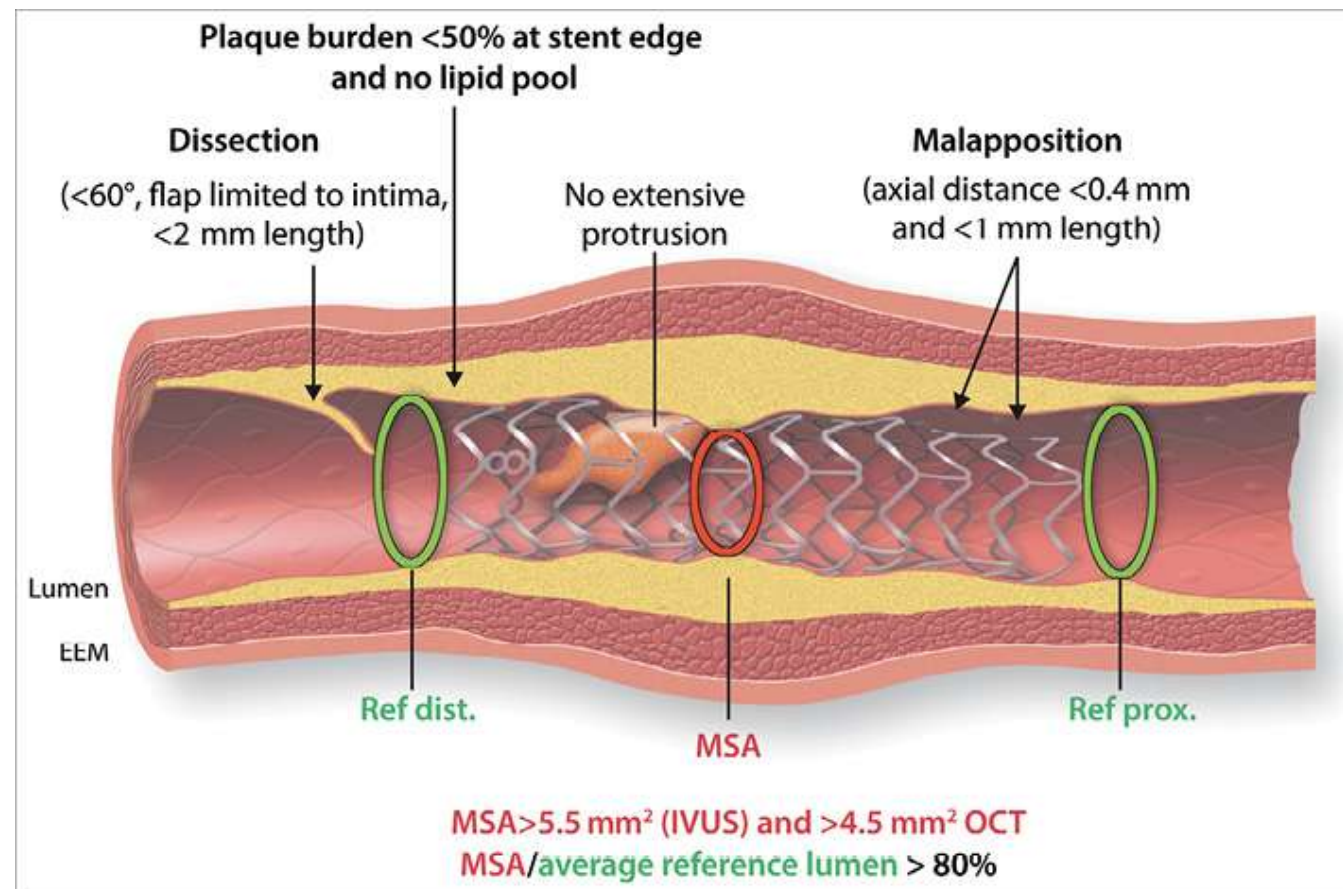
**QUESTION TIME !**

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**Code : #745235**



EuroIntervention 2018

Clinical use of intracoronary imaging. Part 1: guidance and optimization of coronary interventions.

An expert consensus document of the European Association of Percutaneous Cardiovascular Interventions

# CTO et échographie endocoronaire

1. **Localiser la chape fibreuse proximale:** ponction écho guidée
  - CTO en bifurcation sans moignon visualisée
2. **Dépister des dissections (bifurcation):** sub intimal shift
3. **Analyse de la lésion par IVUS**

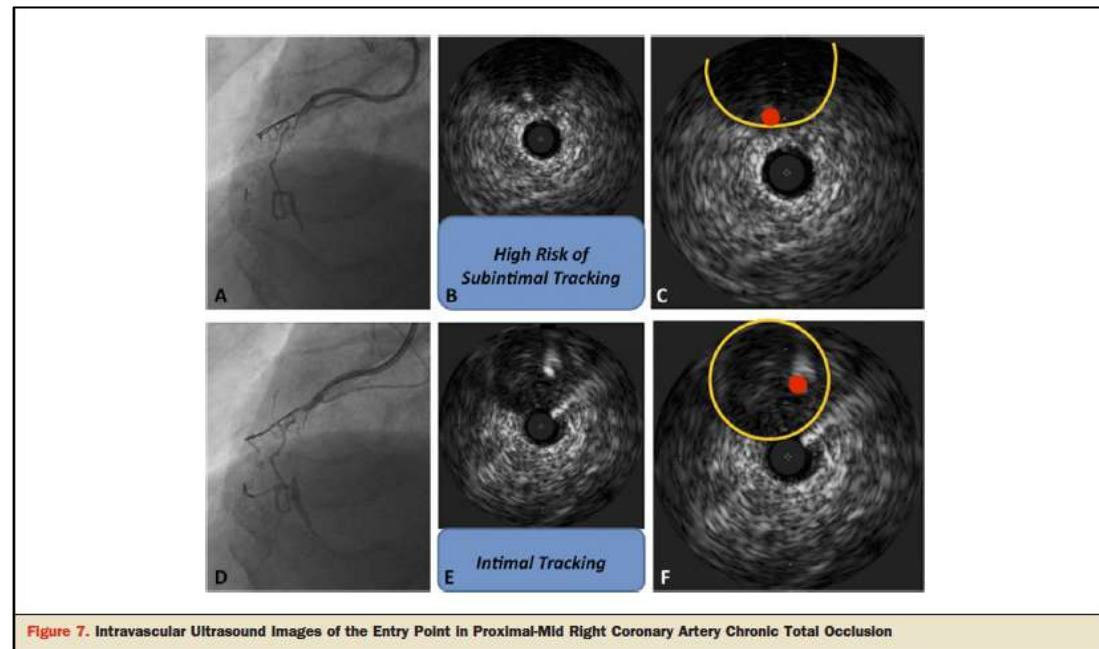
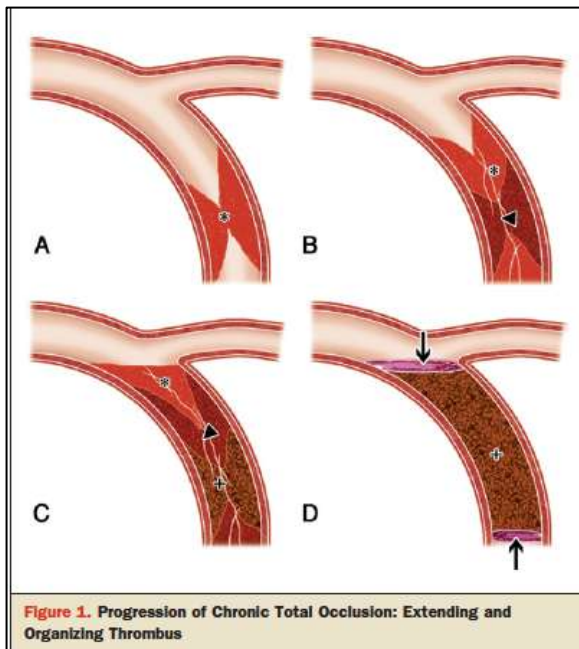
# Ponction guidée par IVUS

## STATE-OF-THE-ART PAPER

### Fundamental Wire Technique and Current Standard Strategy of Percutaneous Intervention for Chronic Total Occlusion With Histopathological Insights

Satoru Sumitsuji, MD,\* Katsumi Inoue, MD,† Masahiko Ochiai, MD,‡  
Etsuo Tsuchikane, MD,§ Fumiaki Ikeno, MD||

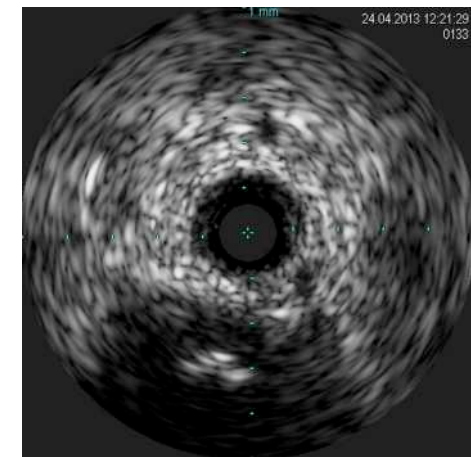
(J Am Coll Cardiol Intv 2011;4:941-51)



- Chape fibreuse proximale ambiguë
- Ponction écho guidée

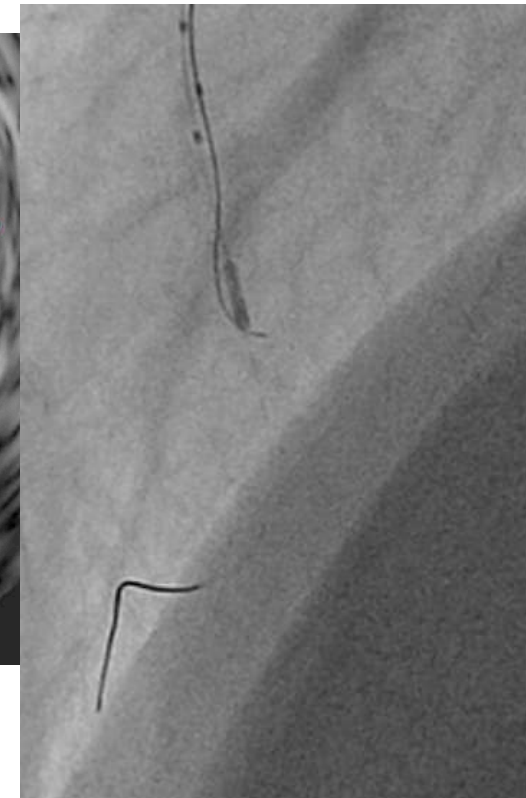
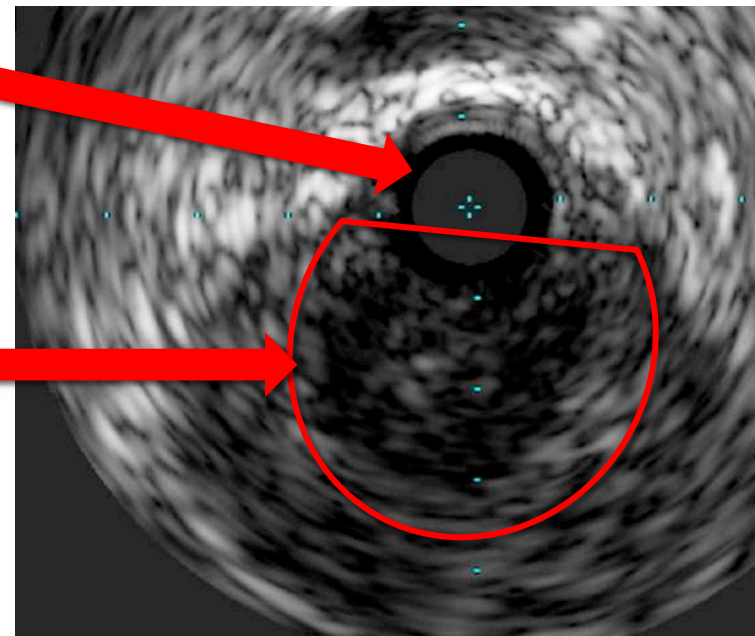
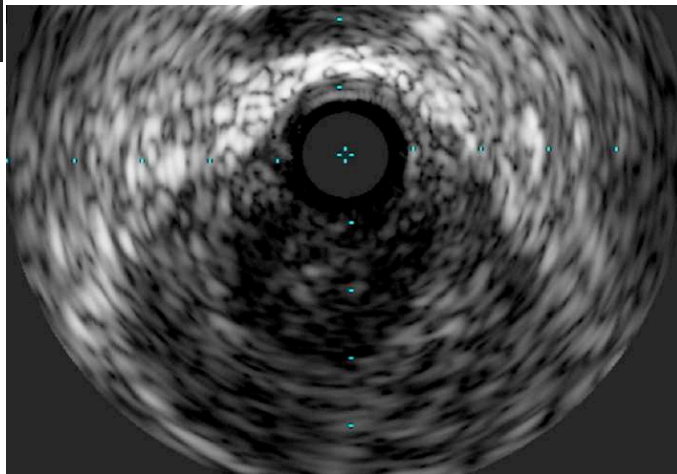
# Ponction guidée par IVUS: cas 1

## Repérage de la chape fibreuse proximale de la CTO en bifurcation sans moignon

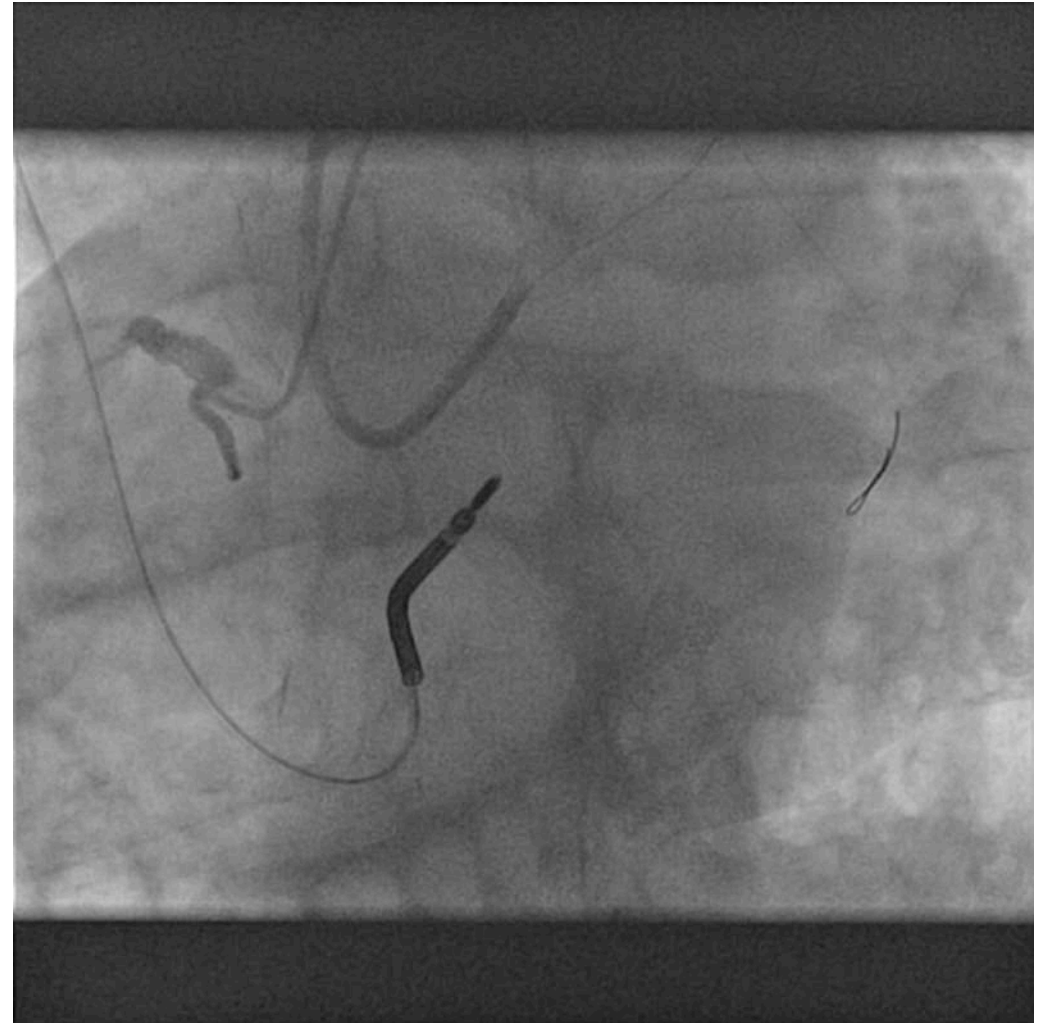
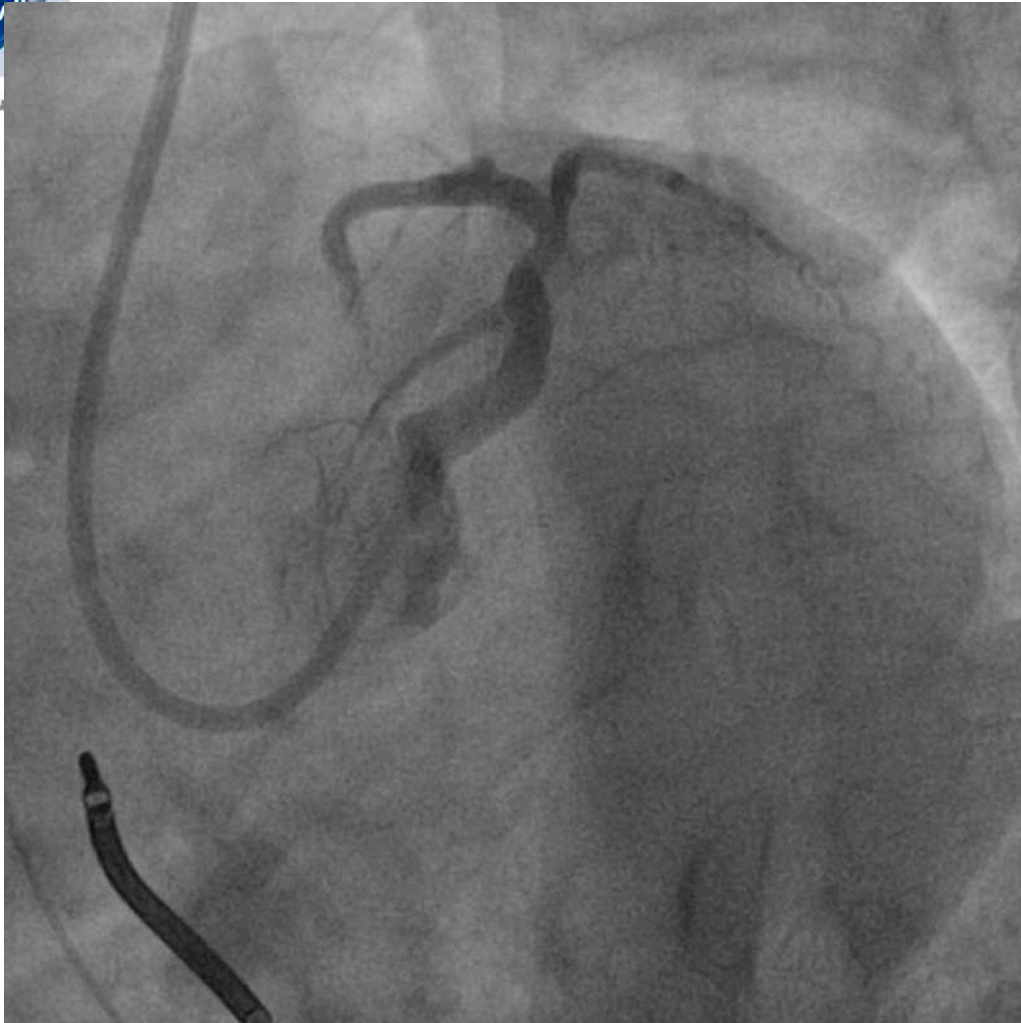


Sonde IVUS, branche fille

Chape fibreuse proximale  
Site d'occlusion

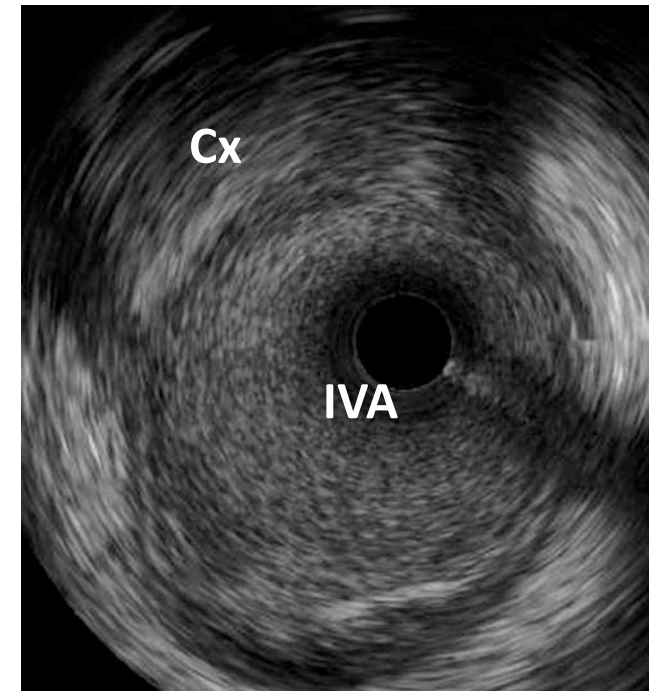
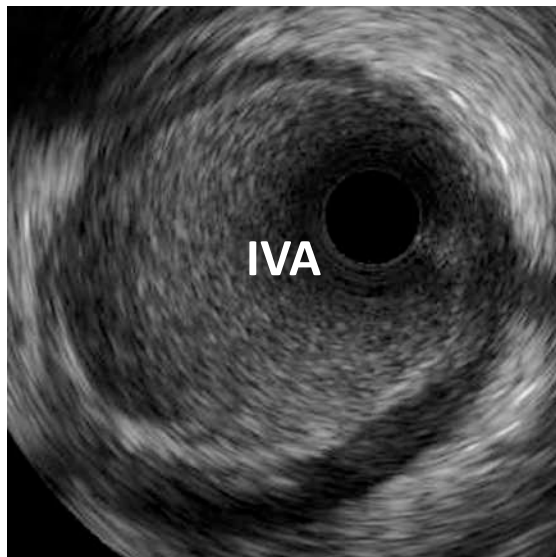


# Ponction guidée par IVUS: cas 2

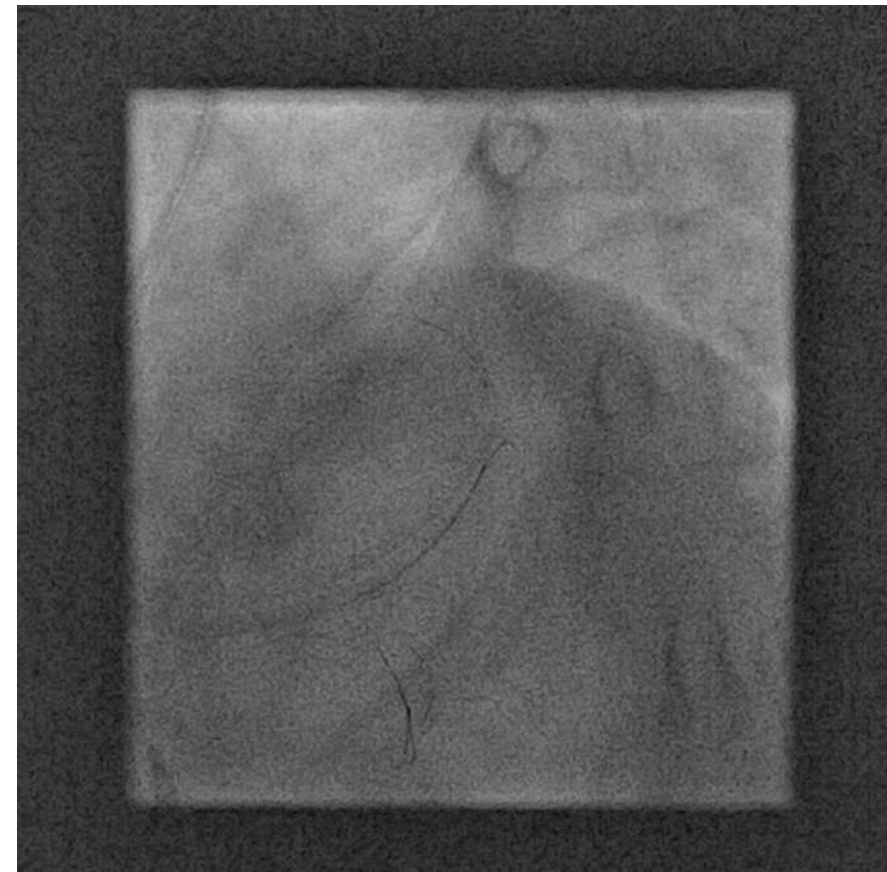
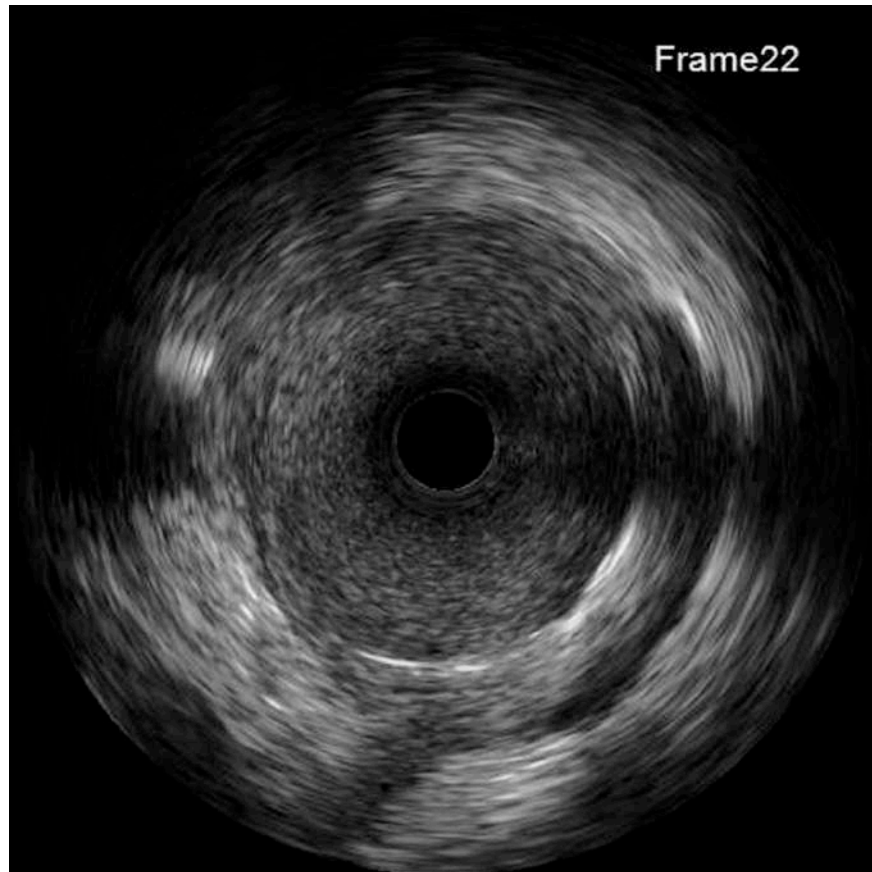




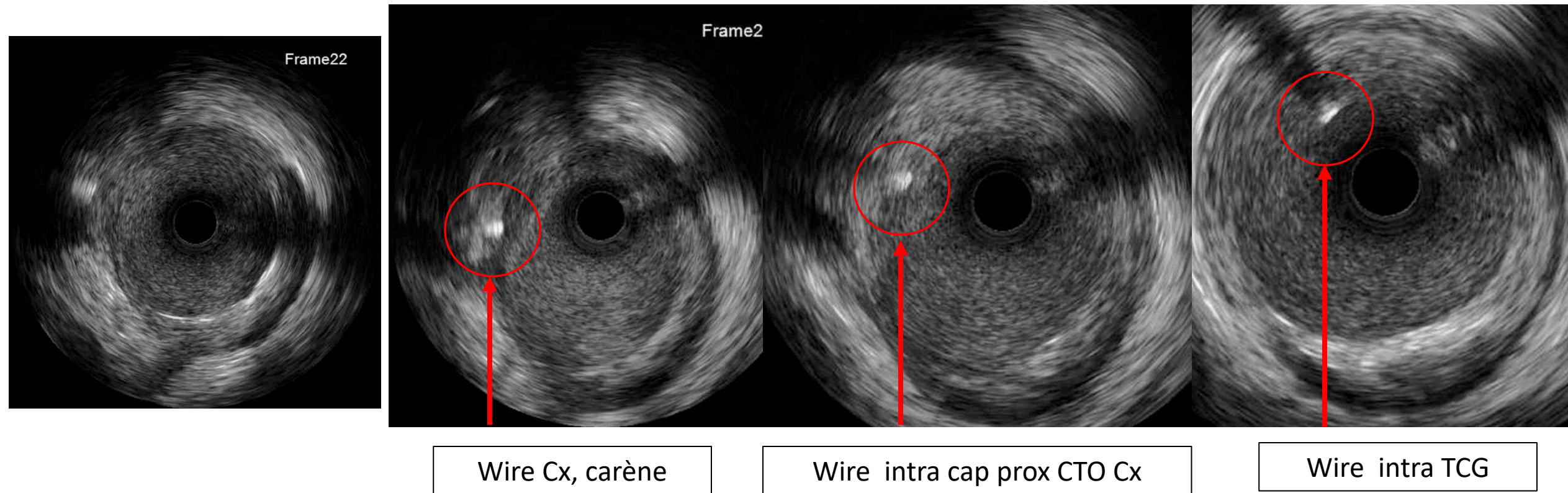
# Ponction guidée par IVUS: cas 2



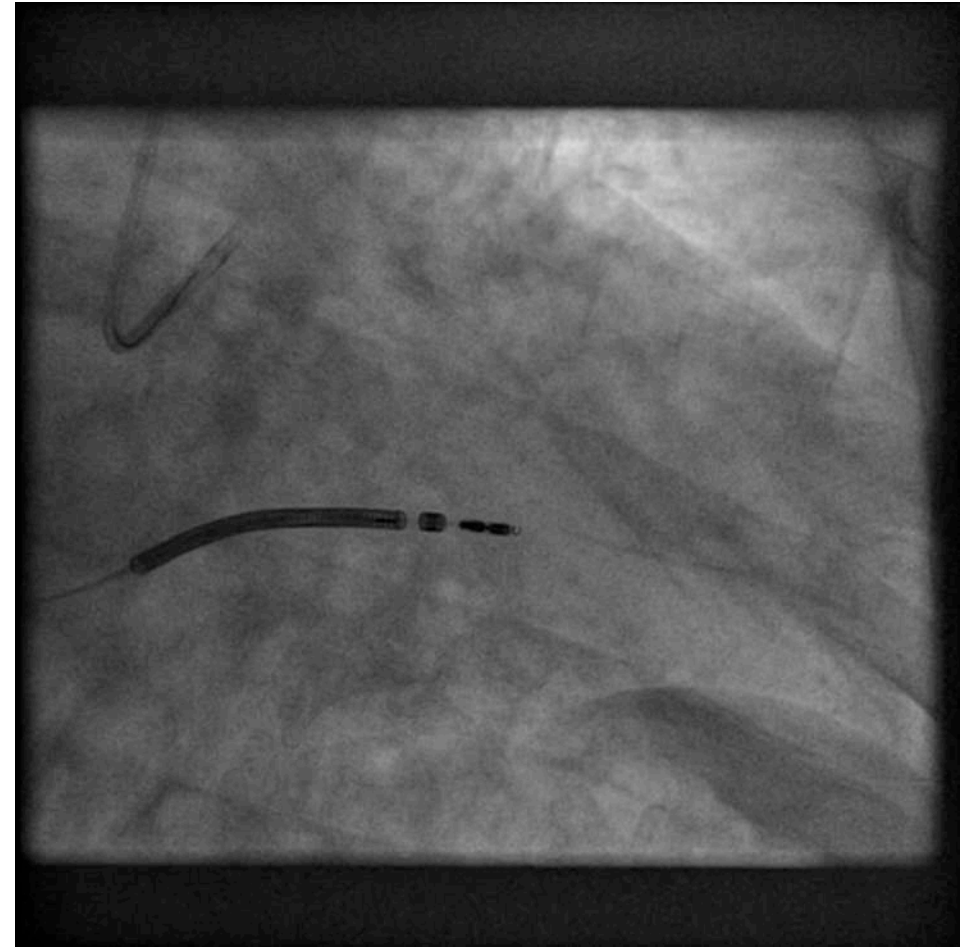
# Ponction guidée par IVUS: cas 2



# Ponction guidée par IVUS: cas 2



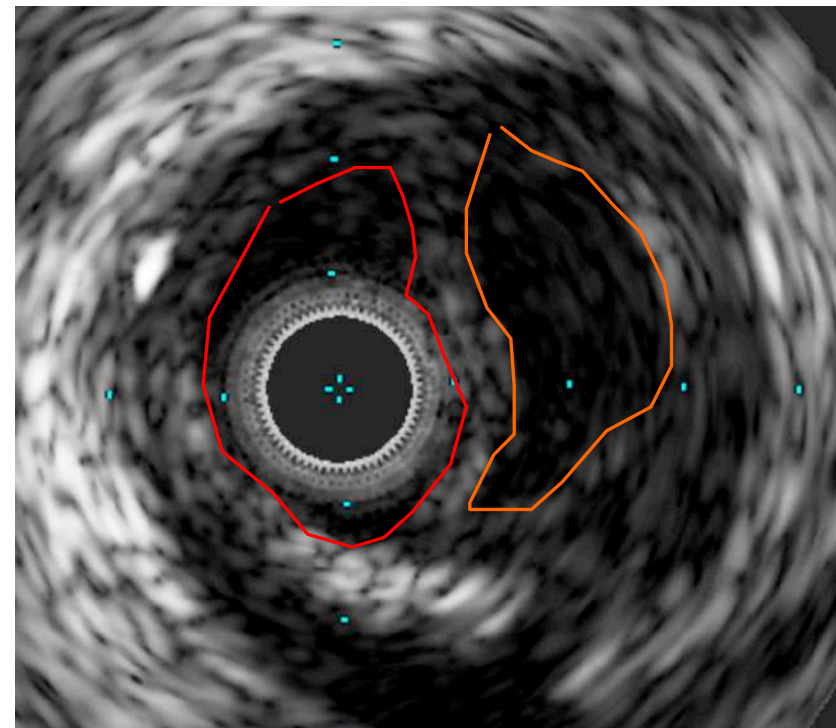
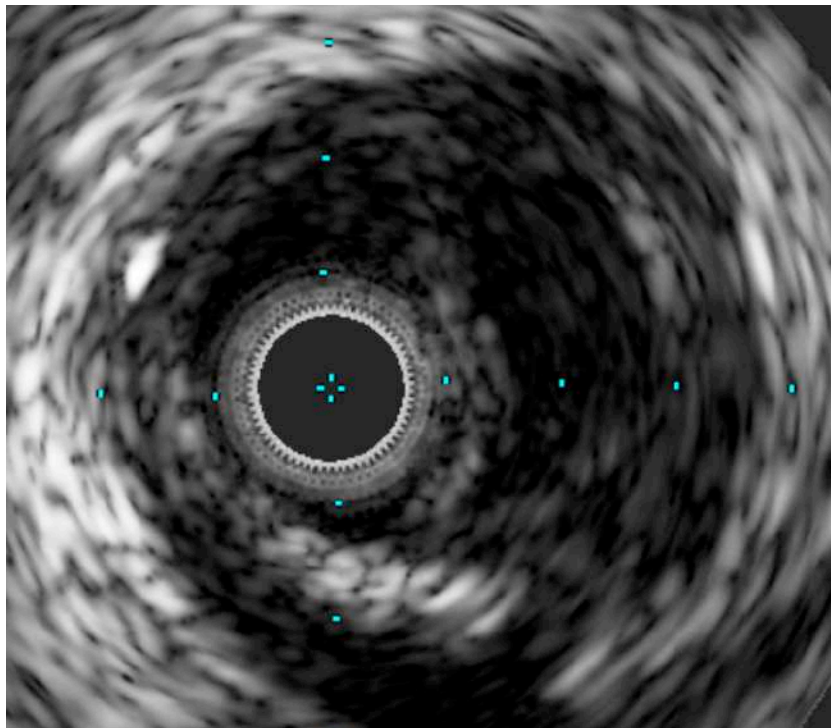
# Ponction guidée par IVUS: cas 2



# IVUS et CTO: recherche d'une dissection

Compréhension de l'angioplastie: Vrai/ faux chenal

Dissection à proximité d'une bifurcation → sub intimal shift



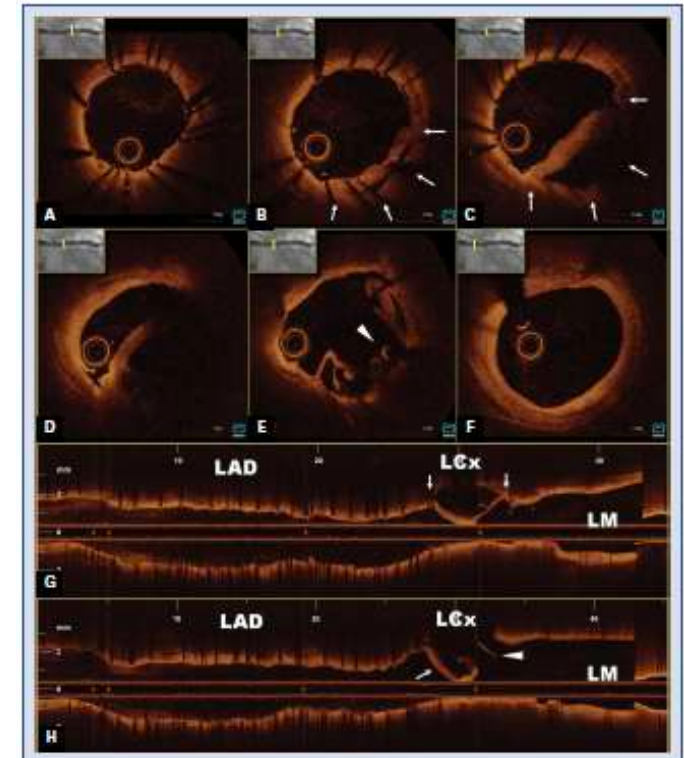
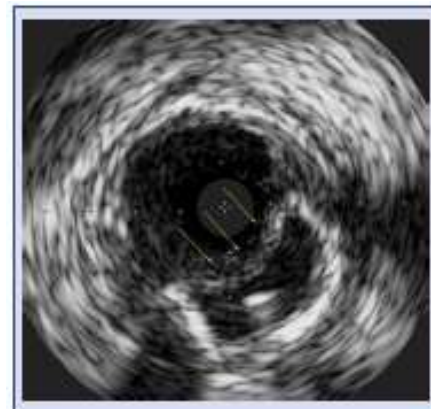
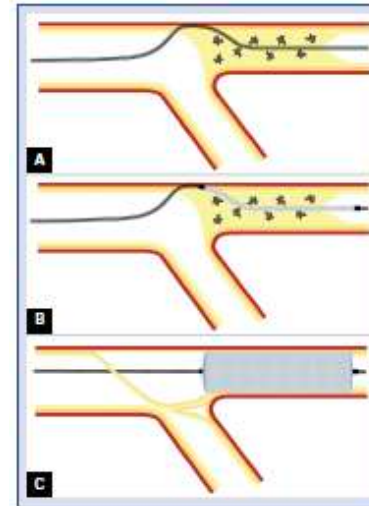
## Sub intimal shift & CTO

- Flap intimal (dissection) en regard de la bifurcation
- **Facteur favorisant:** franchissement sous intimal juste en amont de la carène

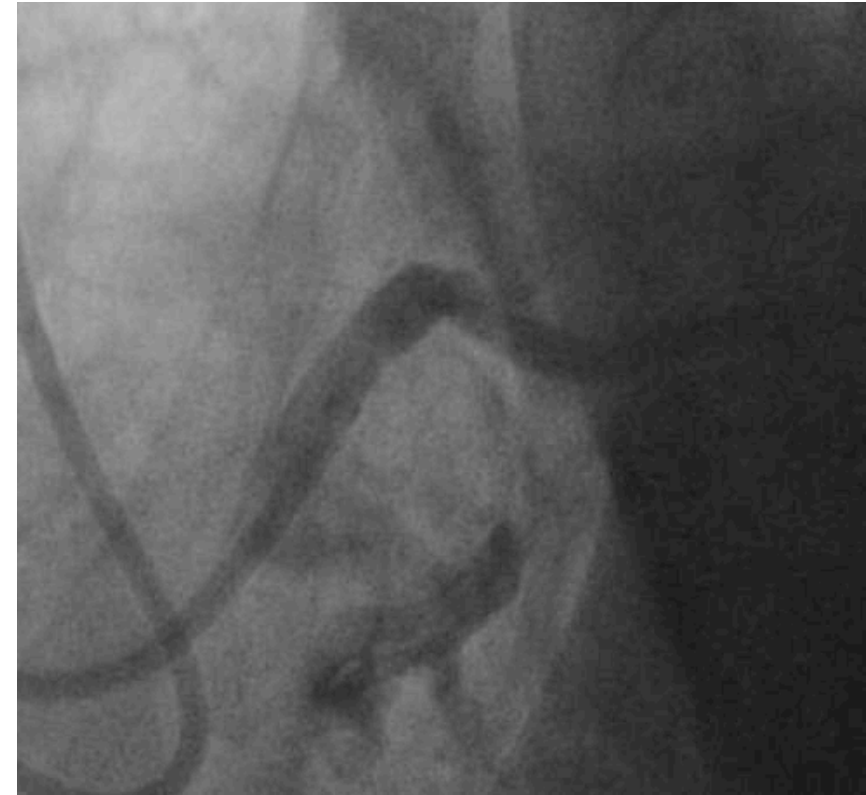
## Subintimal shift as mechanism for side-branch occlusion in percutaneous treatment of chronic total occlusions with bifurcation lesions

Juan Luis Gutiérrez-Chico<sup>1,2</sup>, Carlos Cortés<sup>3,4</sup>, Mohamed Ayoub<sup>5</sup>,  
Bernward Lauer<sup>5</sup>, Sylvia Otto<sup>5</sup>, Bernd Reibeck<sup>2</sup>, Manuela Reibeck<sup>2</sup>,  
Christian Schulze<sup>5</sup>, Kambis Mashayekhi<sup>2</sup>

Cardiology Journal, 2021



# CTO en bifurcation avec franchissement rétrograde



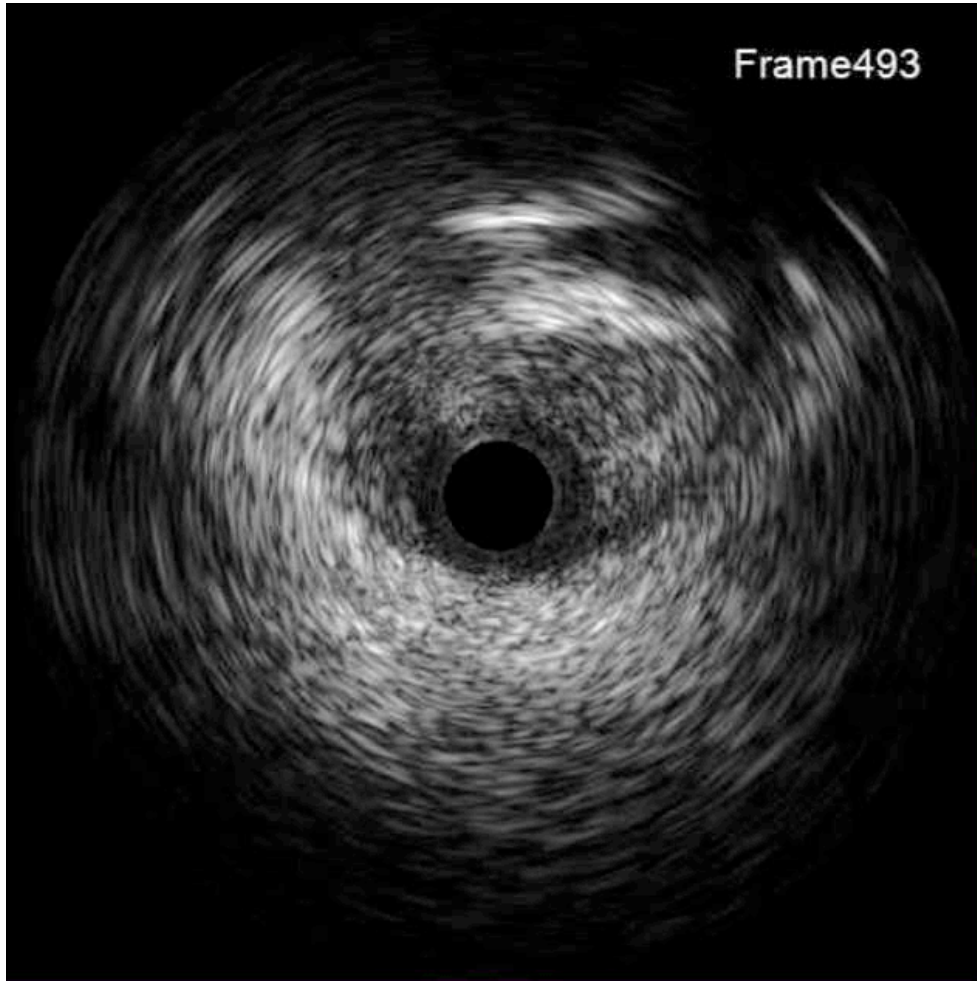
# CTO en bifurcation avec franchissement rétrograde



- **Franchissement rétrograde.**
- **Risque de dissection rétrograde de l'IVA ostiale et du tronc commun, qui pourrait compromettre la circonflexe.**
- **IVUS avant implantation de stent**



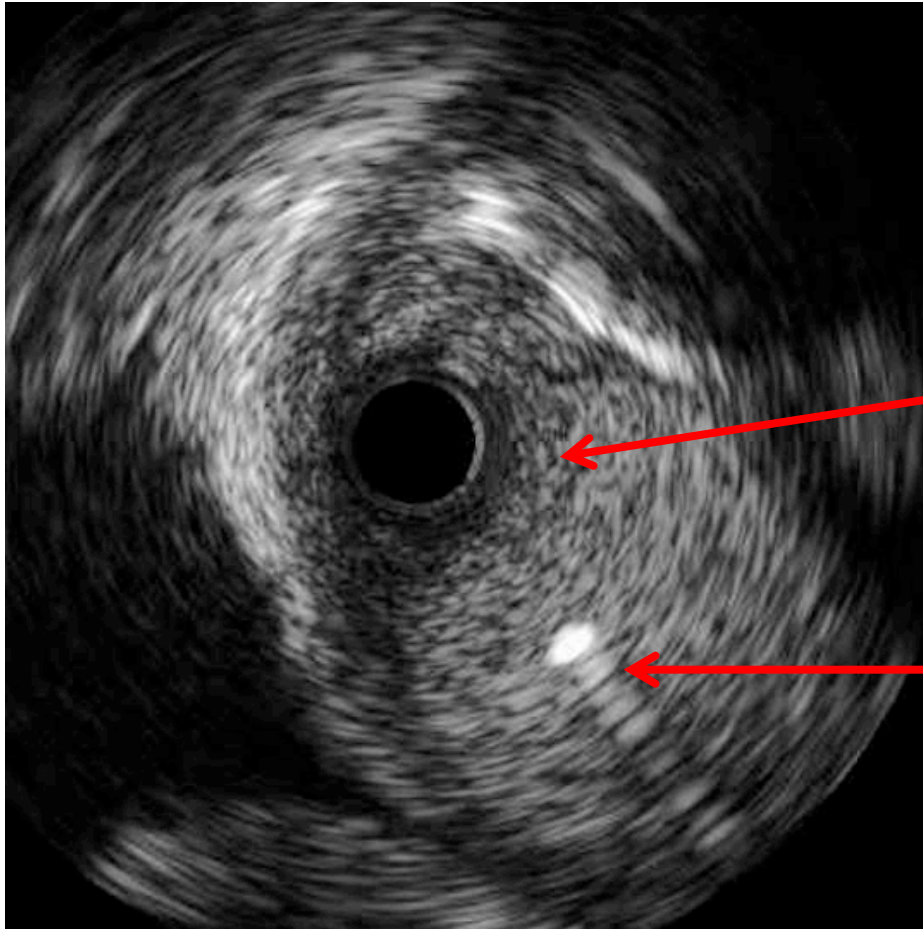
# CTO en bifurcation avec franchissement rétrograde



## IVUS (après franchissement)

- Pullback IVA → TCG
- Guide extra-plaque dans l'IVA
- TCG sain, sans dissection

# CTO en bifurcation avec franchissement rétrograde



## IVUS

- IVUS IVA ostiale
- Pas de dissection en regard de la carène
- Guidewire Circonflexe

# CTO en bifurcation avec franchissement rétrograde

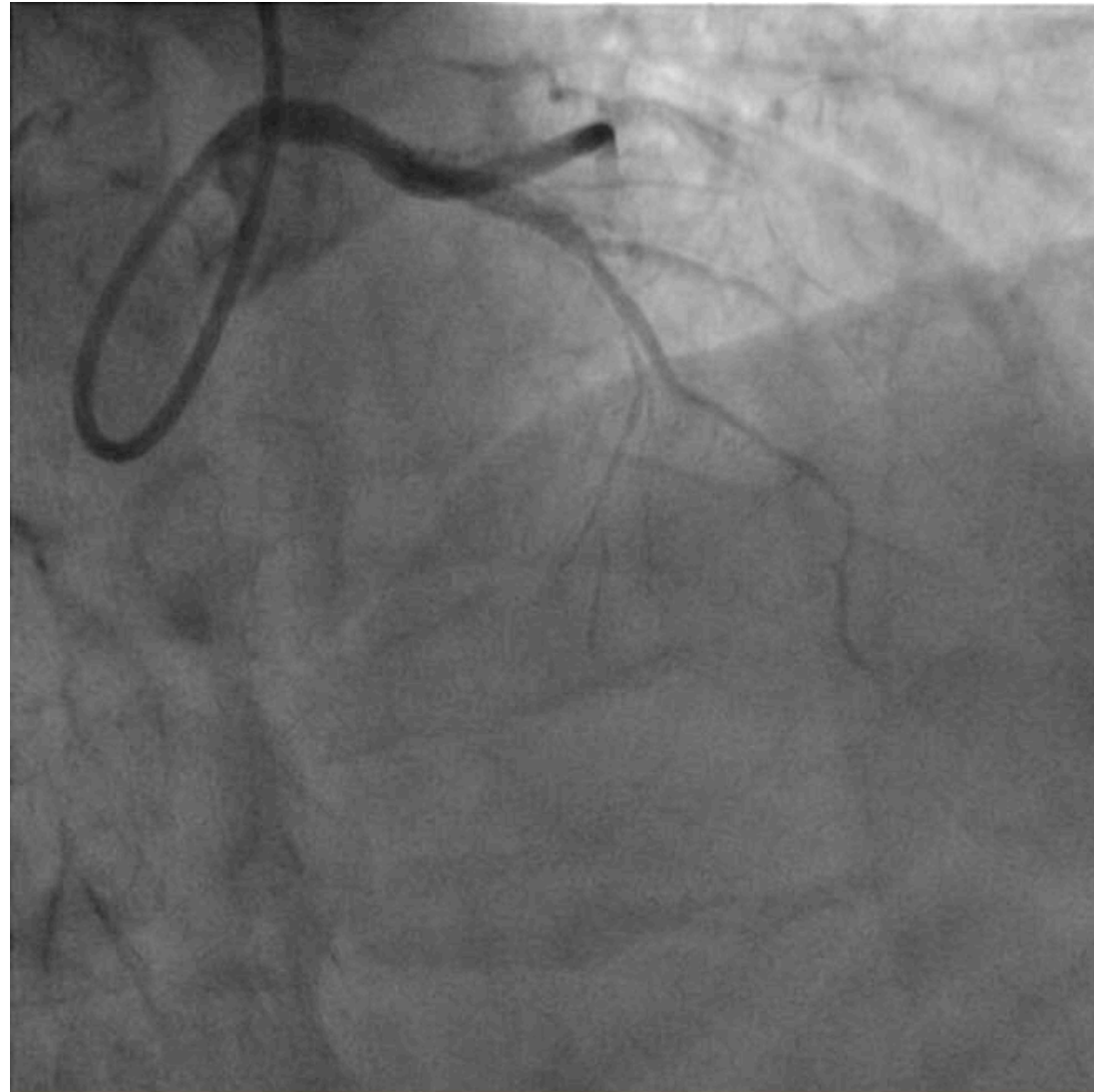


## IVUS

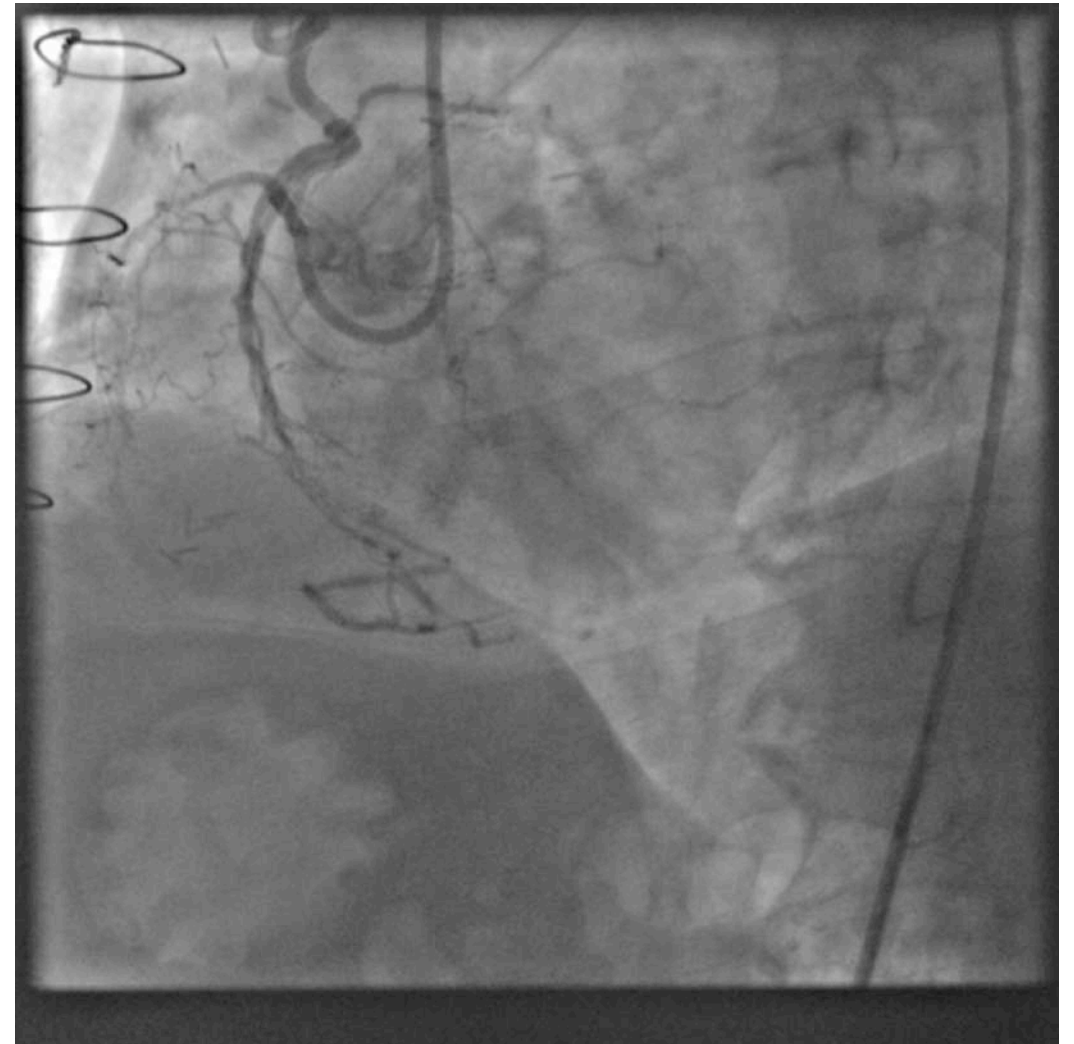
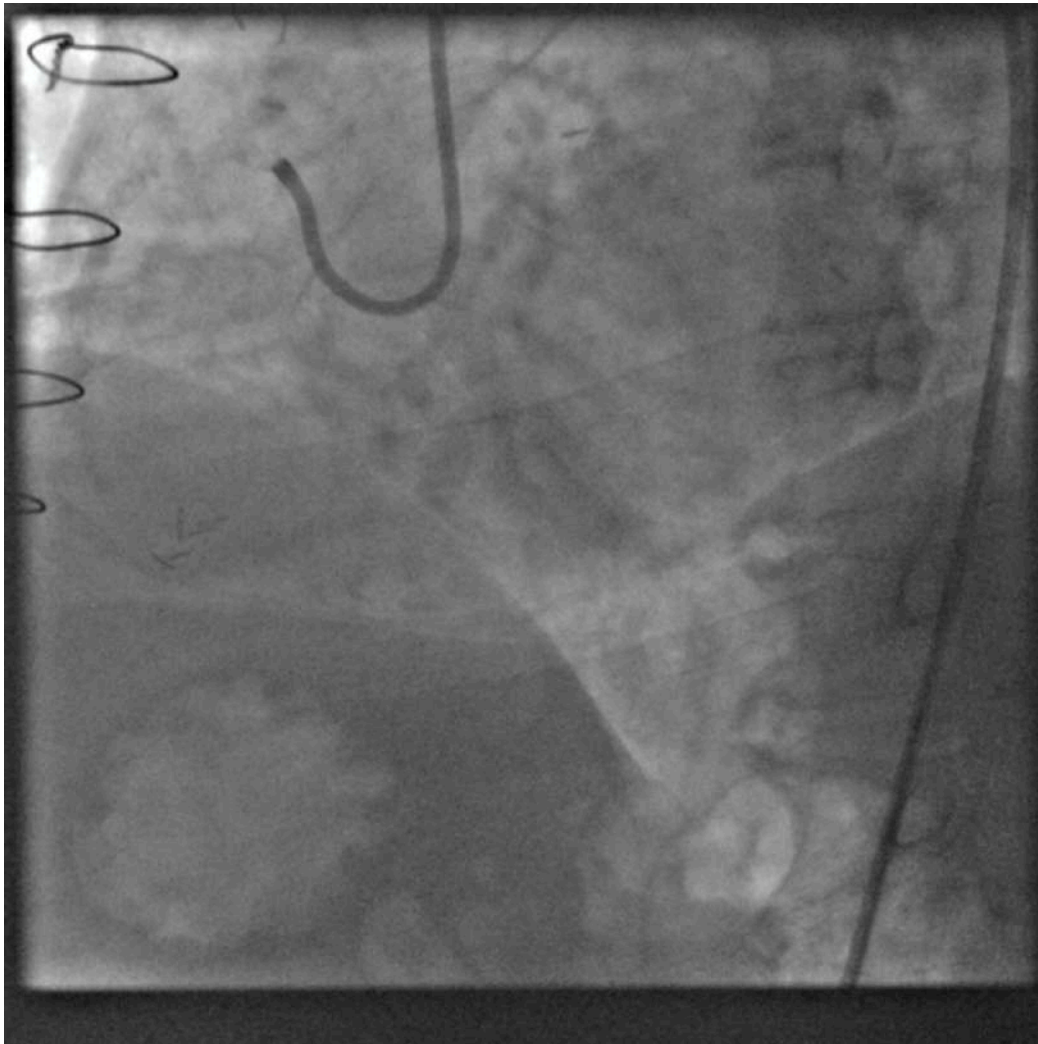
- Pullback Cx → TCG
- TCG sain, sans dissection

→ Stenting bifurcation avec un seul stent

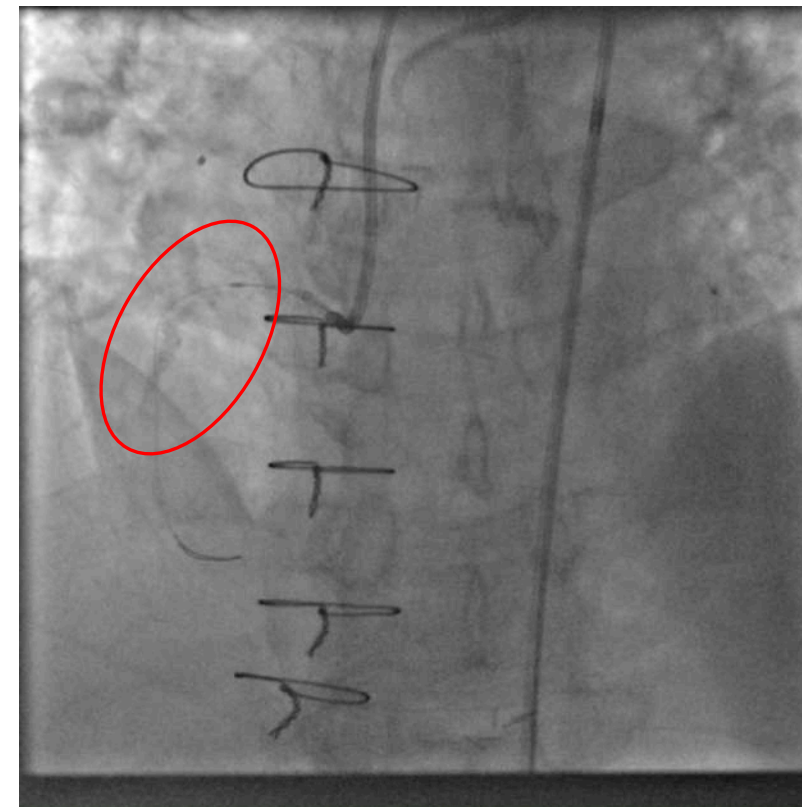
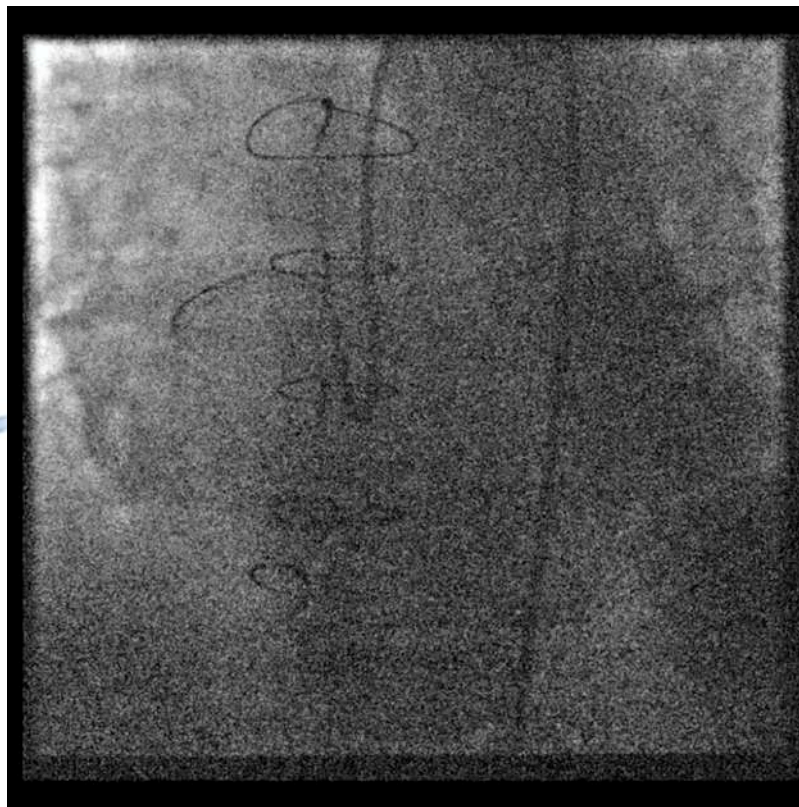
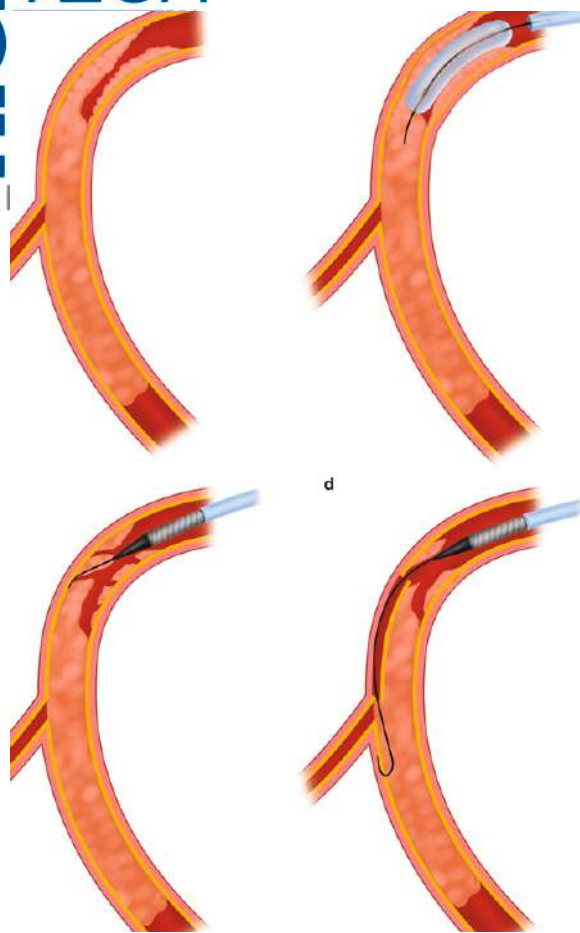
# CTO en bifurcation avec franchissement rétrograde



# IVUS et longue CTO complexe et calcifiée

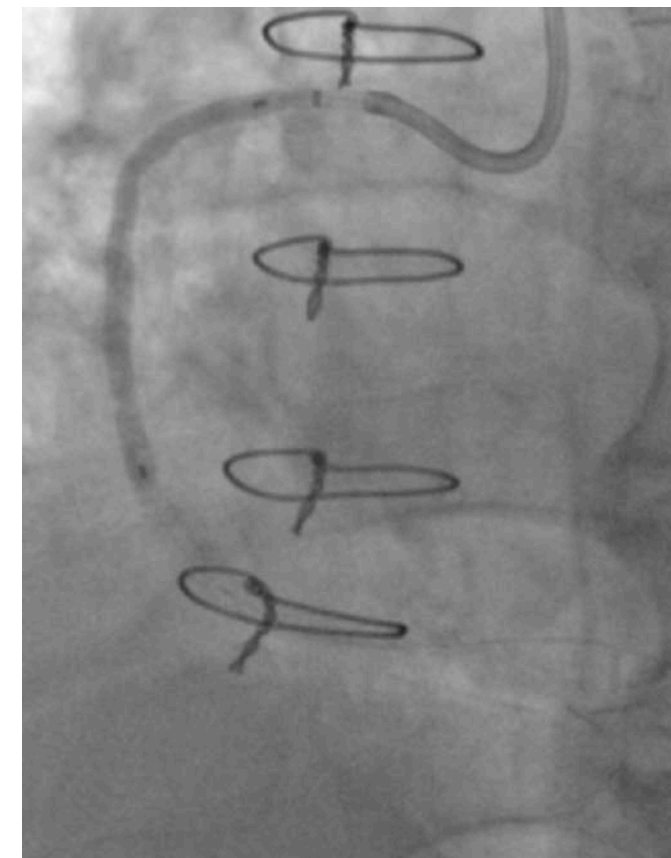
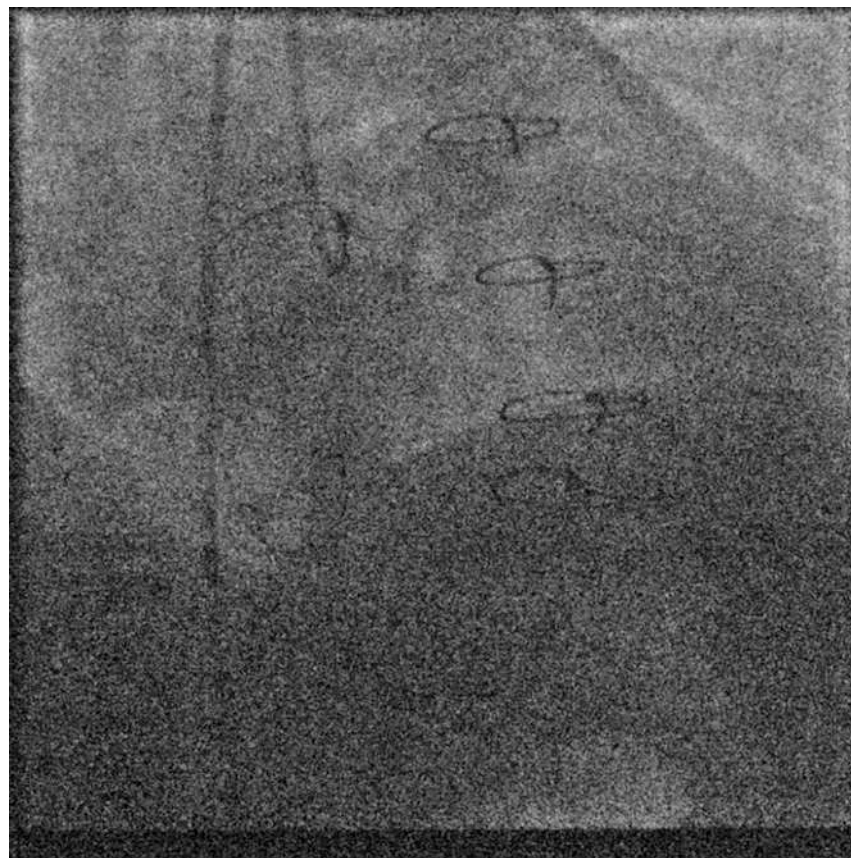


# IVUS et longue CTO complexe et calcifiée

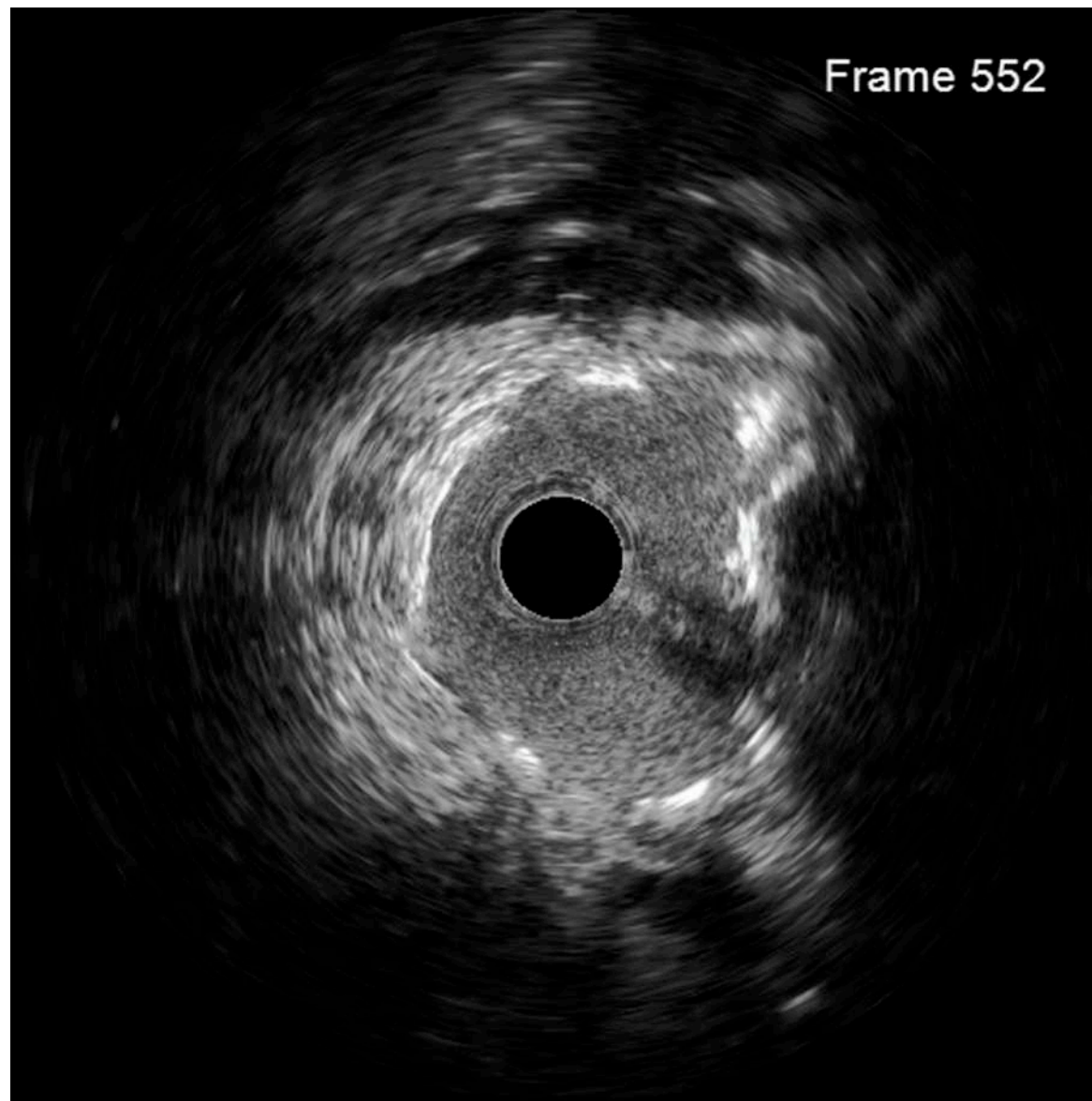


**BASE technique:**  
Balloon-Assisted Sub-intimal Rentry

# IVUS et longue CTO complexe et calcifiée

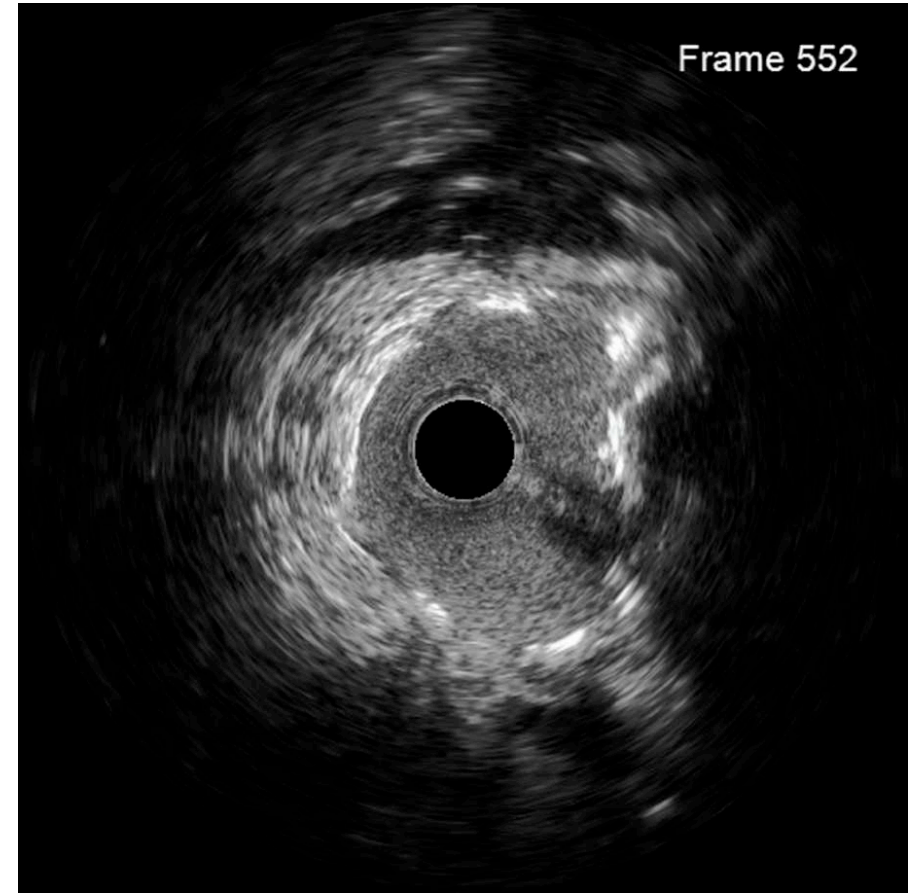
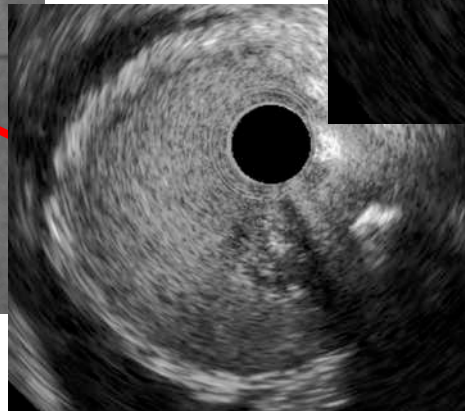
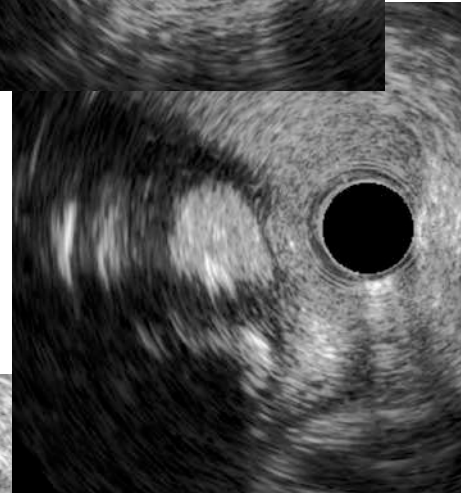
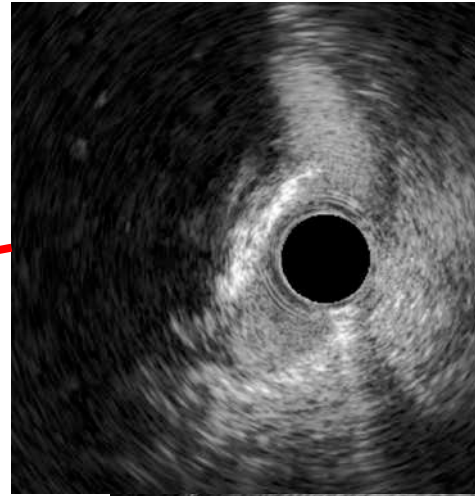
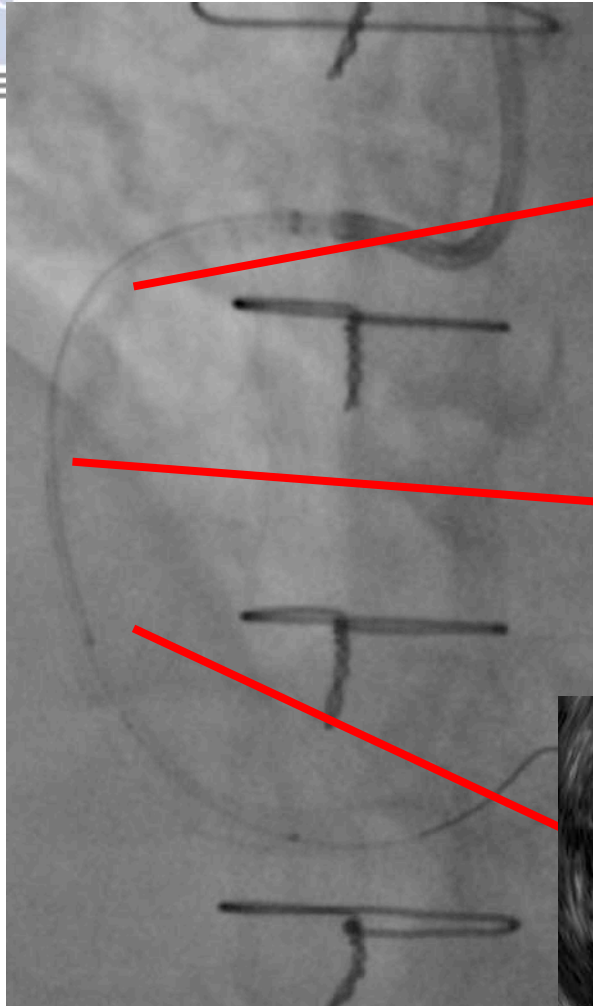


# IVUS et longue CTO complexe et calcifiée

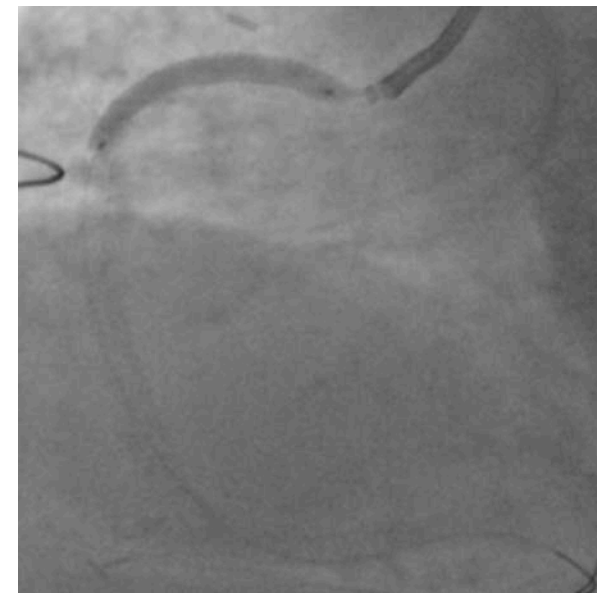
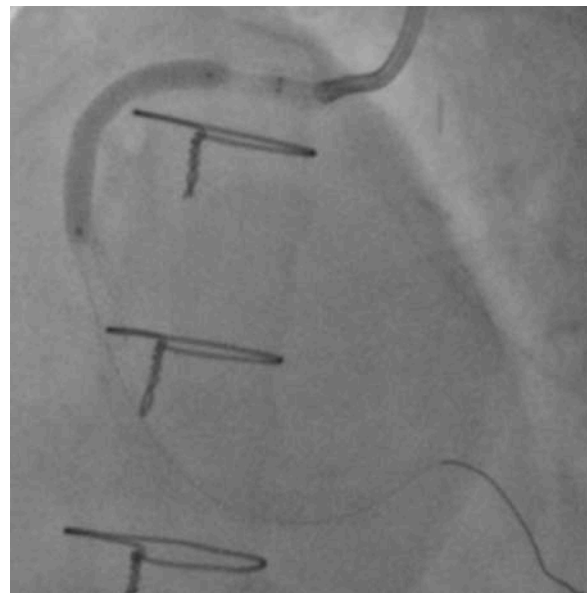
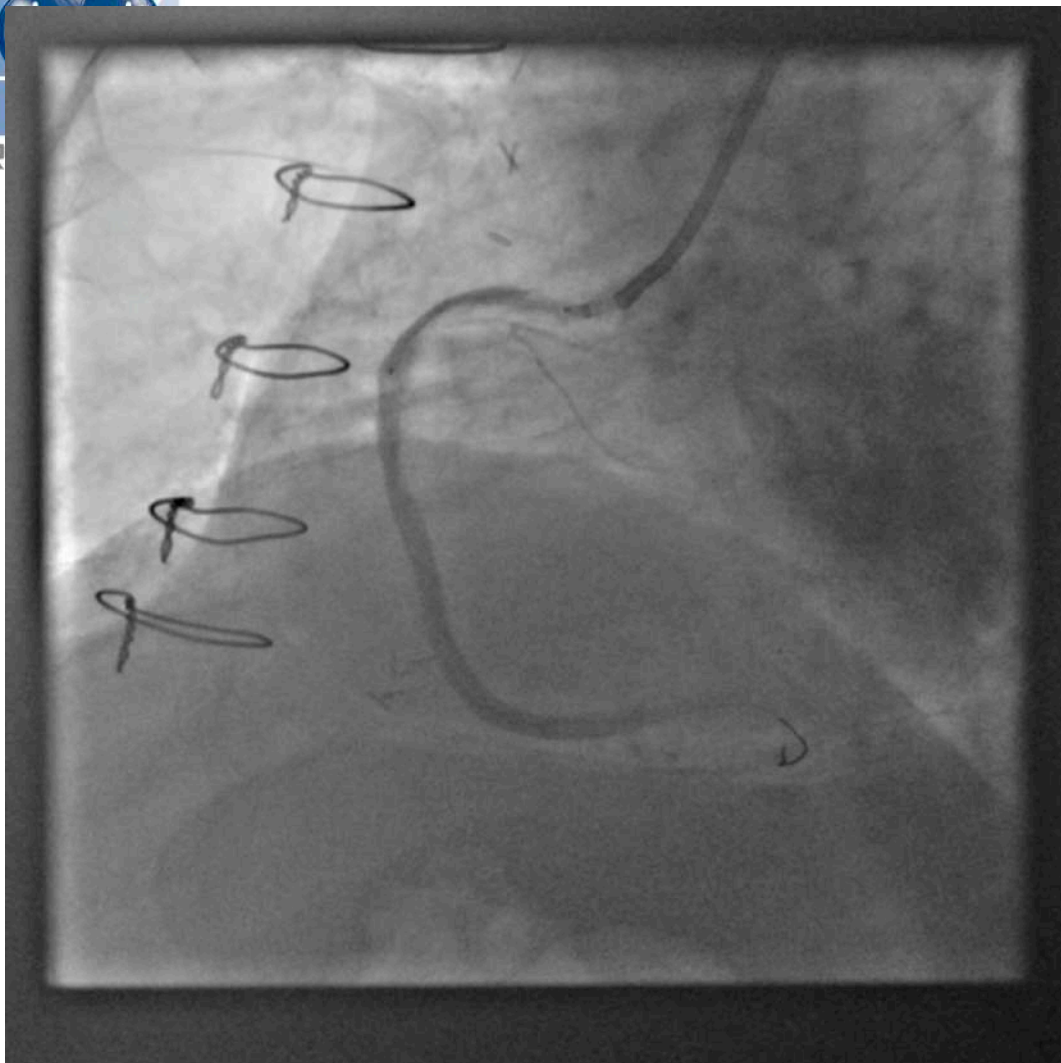




# IVUS et longue CTO complexe et calcifiée



# IVUS et longue CTO complexe et calcifiée



Prédilatation: ballons de taille croissante

# IVUS et longue CTO complexe et calcifiée



Post stent DES

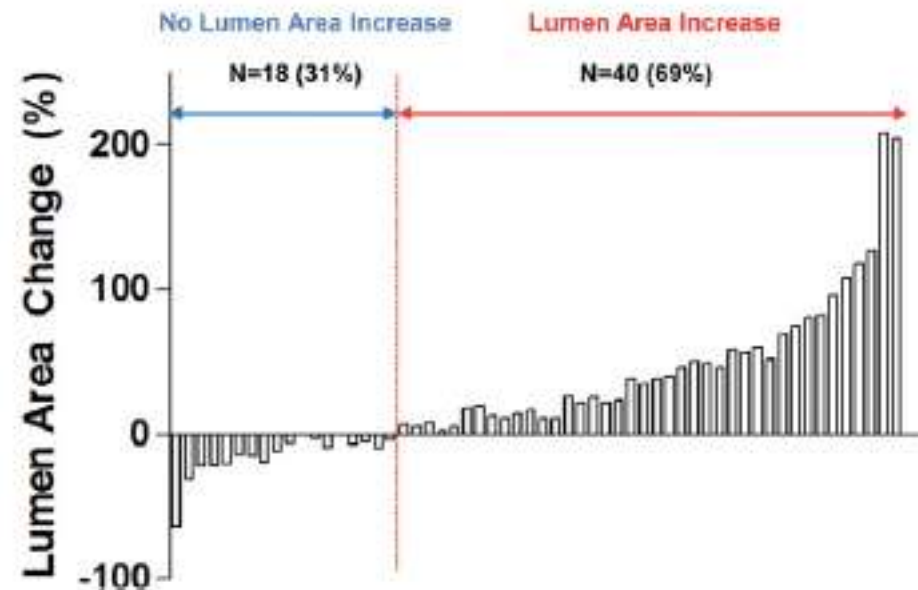


Stent couvert

# Effet vasomoteur après revascularisation

## The Recanalization of Chronic Total Occlusion Leads to Lumen Area Increase in Distal Reference Segments in Selected Patients

An Intravascular Ultrasound Study



**Figure 2.** Change of Lumen Area Between Baseline and 6 Months After TO Recanalization of the 58 Patients

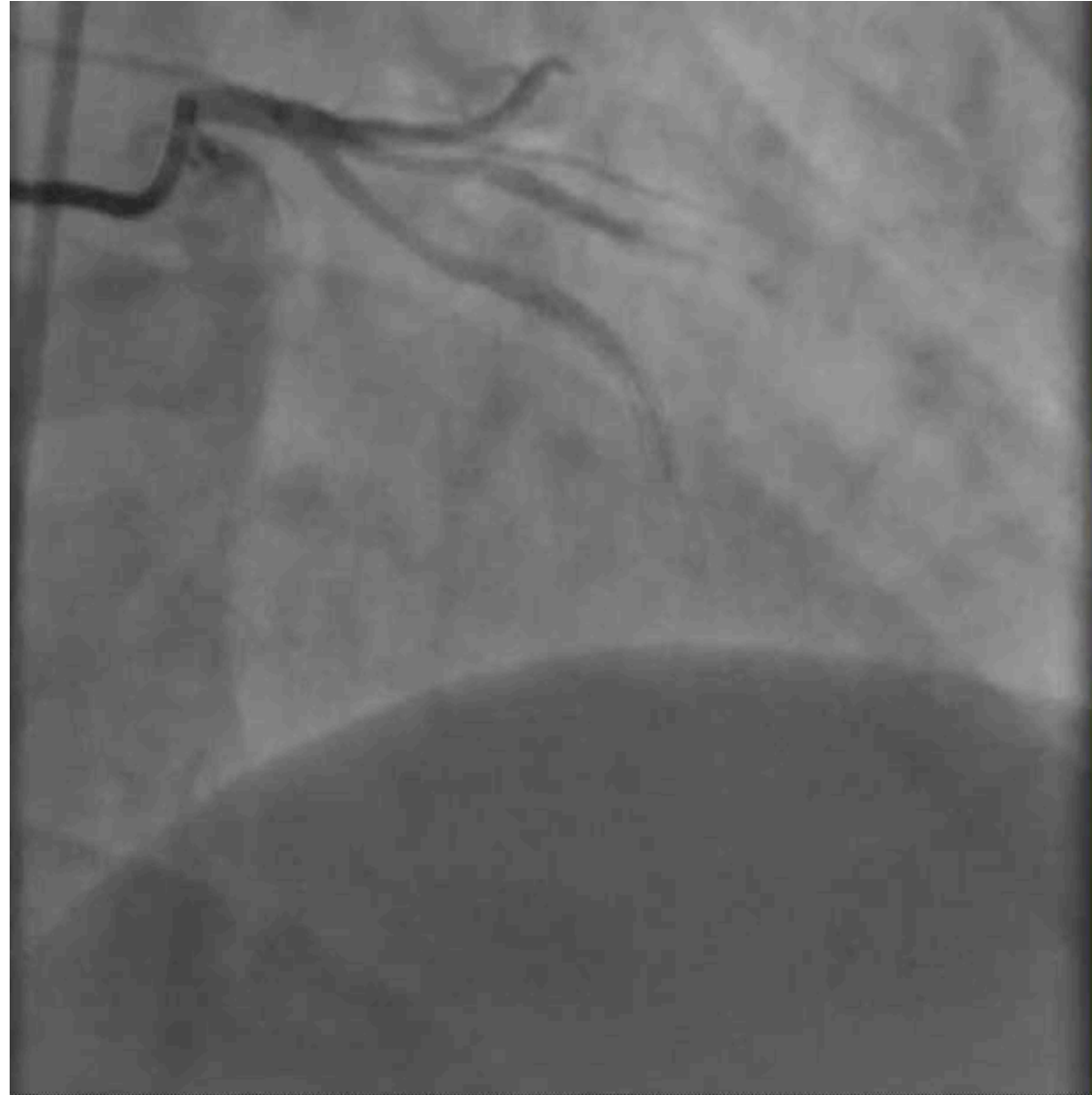
# Angioplastie CTO IVA



# Contrôle final



# Contrôle à 4 mois



# CTO et IVUS HD

**Localiser la chape fibreuse proximale:** ponction écho guidée

- CTO en bifurcation sans moignon visualisée

**Dépister des dissections (bifurcation):** sub intimal shift

**Analyse de la lésion par IVUS:**

- caractéristiques de la CTO
- Trajet intra plaque, autour de la plaque
- Calcifications: bourgeon Ca<sup>++</sup>, anneau Ca<sup>++</sup>
- longueur de lésion