



**28-30  
JANVIER  
2026**

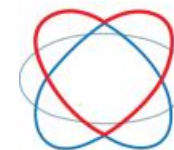
MARSEILLE  
PALAIS DU PHARO

# Outils CTO et lésions complexes

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**Clinique Saint - Augustin**

**Bordeaux**



Cardiologie Médicale  
et Interventionnelle  
SAINT-AUGUSTIN

# Conflits d'intérêts

**Dr Nicolas Boudou**

Proctoring CTO: Asahi Intecc

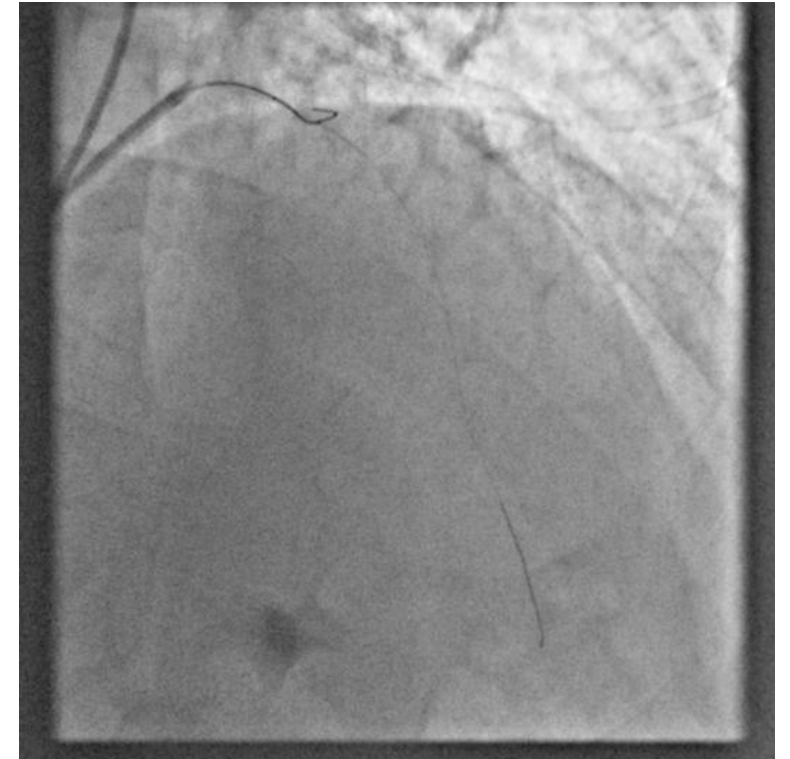
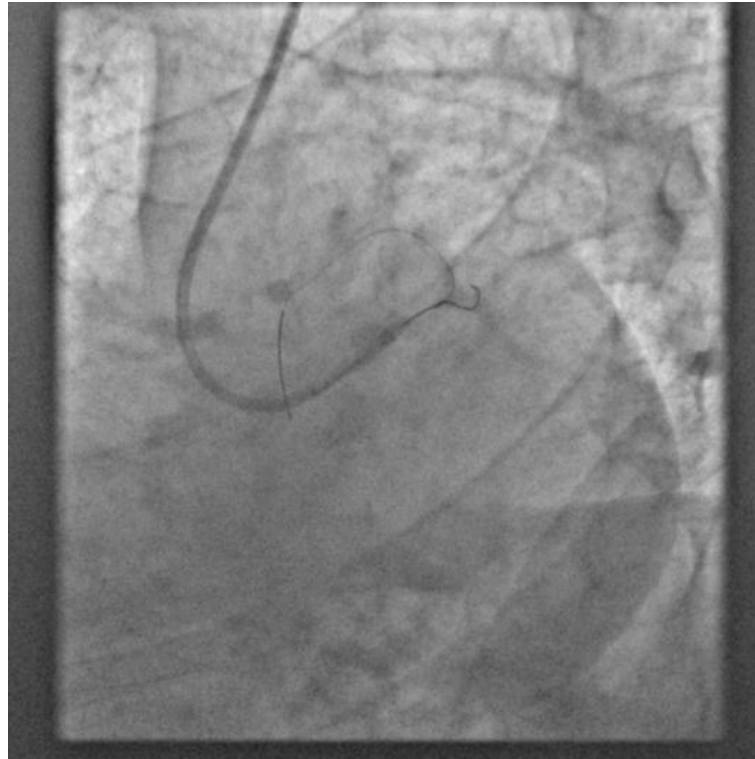
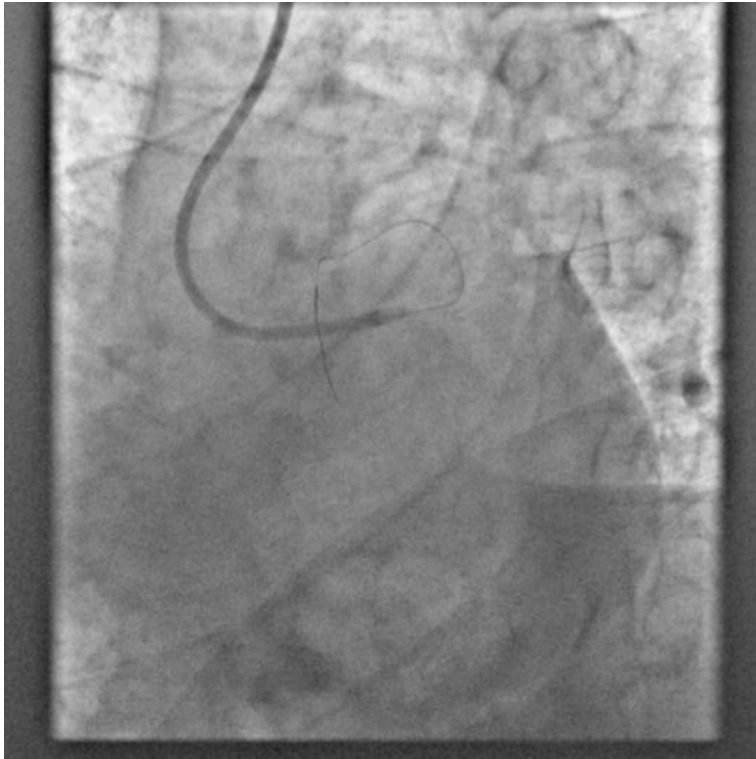
# Lésions complexes

- **Vraies bifurcations**
- **CTO**
- **Lésions calcifiées**
- **Accès difficiles (tortuosité, angulation, variantes anatomiques)**
- **Gestion des complications d'angioplastie: dissections, ...**

# Outils CTO

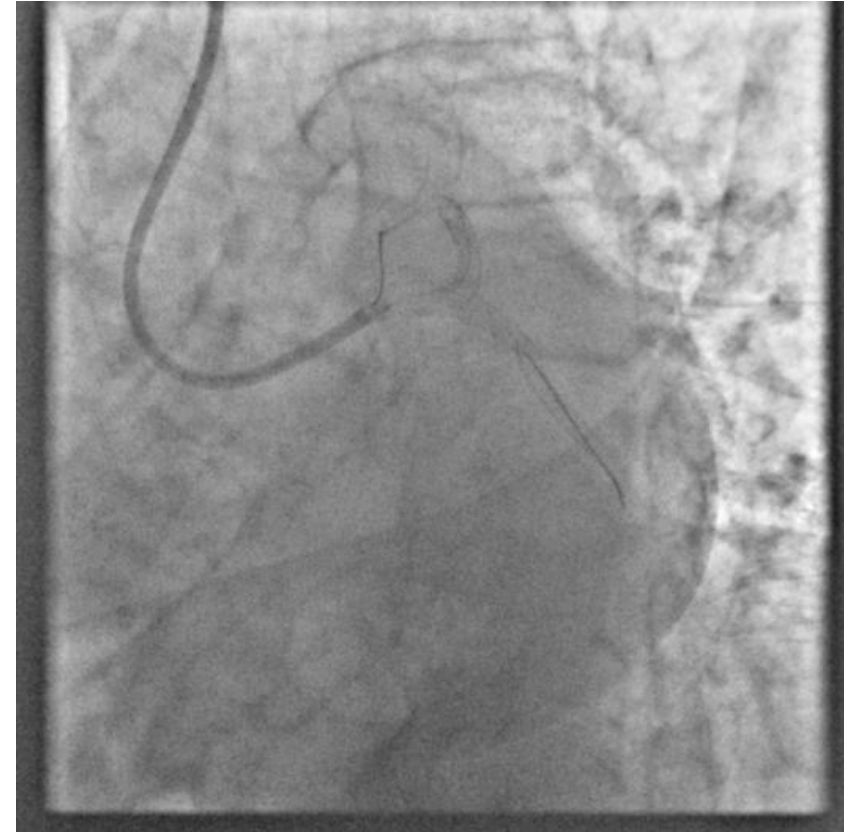
- **Guidewires** : ponction, dissection, franchissement, acheminement
- **Microcathéters** : approche, franchissement, échange de guide
- **Tous les outils d'angioplastie**
- **Stratégies:**
  - Accès à la lésion
  - Dissections « contrôlées » (minimiser les injections) = angioplastie CTO
  - IVUS guided si besoin
  - Stenting

# Dissection, branche fille: accès et franchissement



**Microcathéter ( angulé, double lumière?,...) et Guidewires**

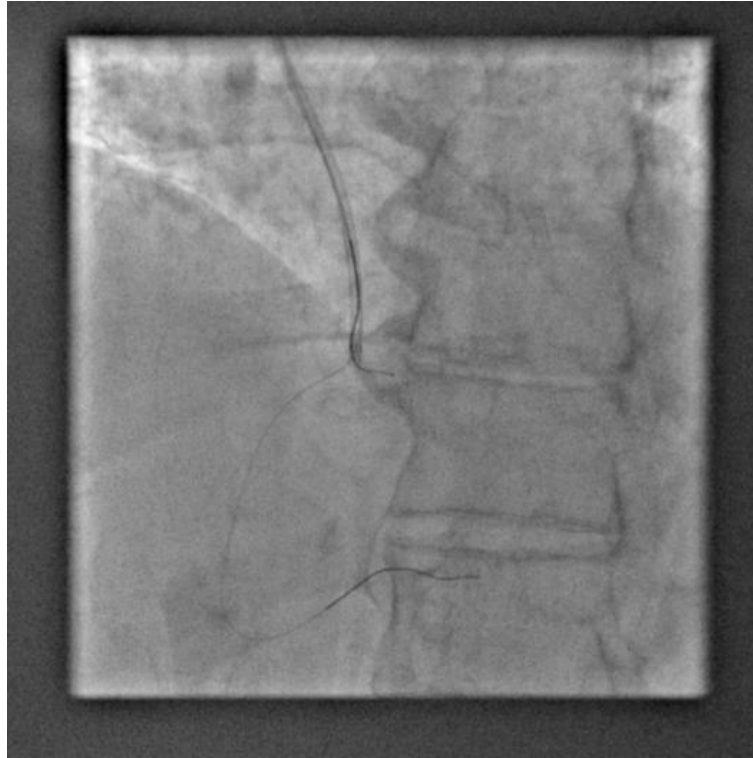
# Dissection, branche fille: accès et franchissement



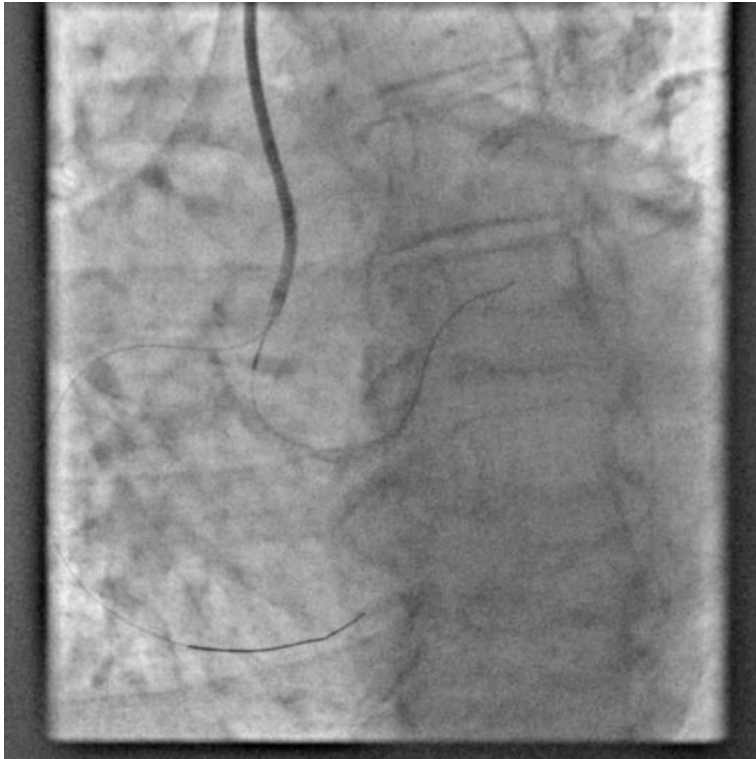
**Microcathéter angulé et Guidewire hydrophile effilé « soft »:**

Franchissement sans prolapsus, échange de guide

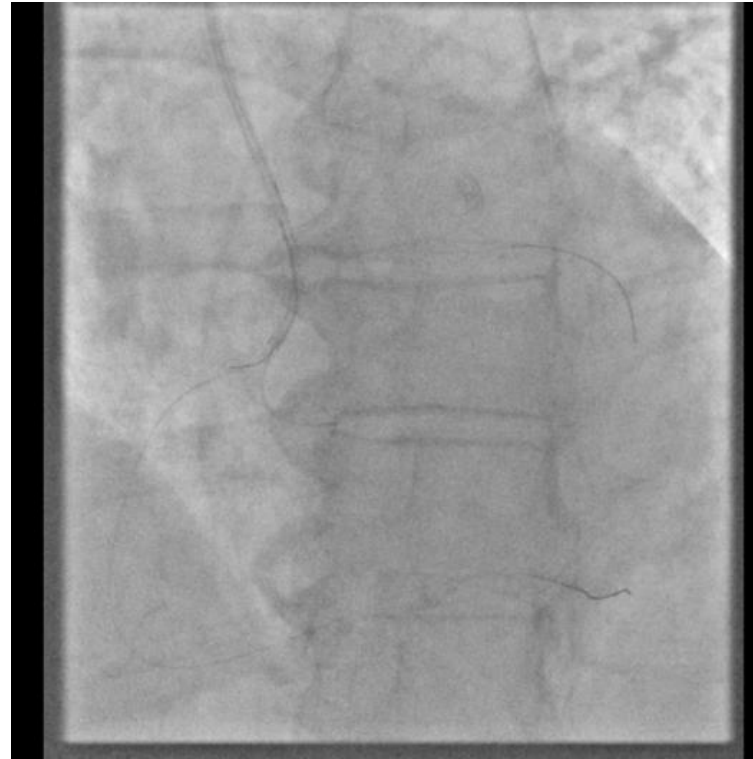
# Dissection induite, variante anatomique



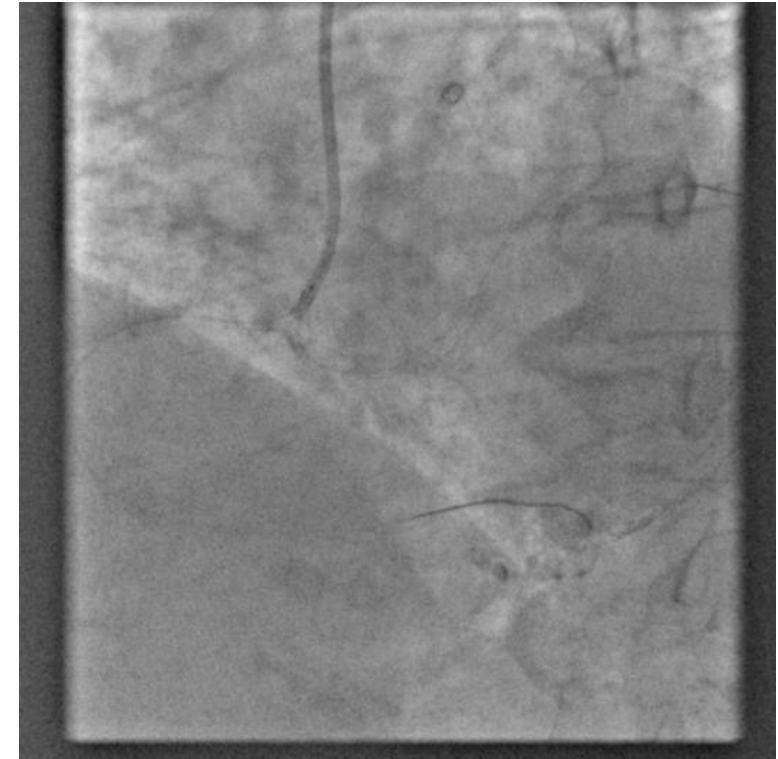
# Dissection induite, variante anatomique



**Microcatheter + guide: faux  
chenal**  
(stabilisation du cathéter)



**Bifurcation et dissection de branche**



# Préserver un branche fille

**Table 2. Side branch protection and rescue techniques.**

TECHNIQUE	WHEN TO APPLY	DESCRIPTION
<b>Jailed wire</b>	Before MV stenting	Wire placement in the SB
<b>Jailed balloon protection</b>	Before MV stenting	Small-diameter balloon placed in the SB and kept uninflated during MV stent deployment
<b>Jailed microcatheter (including jailed Corsair)</b>	Before MV stenting	Microcatheter placed in the SB and kept uninflated during MV stent deployment
<b>Inflated jailed balloon protection (including modified jailed balloon and balloon-stent kissing)</b>	Before MV stenting	Small-diameter balloon (with different degrees of protrusion in the MV) placed in the SB and kept inflated during MV stent deployment
<b>Semi-inflated jailed balloon protection</b>	Before MV stenting	Small-diameter balloon placed in the SB and inflated at low atmospheres during MV stent deployment
<b>Rescue balloon jailing</b>	After MV stenting, in the case of SB occlusion (or jailed wire entrapment)	Small-diameter balloon advancement and inflation over the jailed wire
<b>Rescue microcatheter jailing</b>	After MV stenting, in the case of SB occlusion (or jailed wire entrapment)	High-penetration microcatheter advancement over the jailed wire

MV: main vessel; SB: side branch

# Préserver un branche fille

EuroIntervention

**CENTRAL ILLUSTRATION** Preserving SB access during provisional stenting.

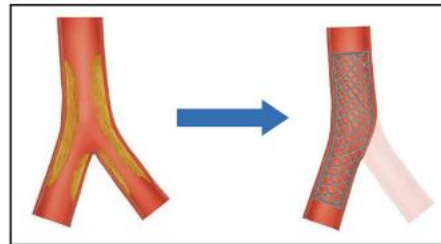
## Prevention

### Conventional

- Preshaped wires
- Reverse wire technique
- Dual lumen microcatheter
- Angulated microcatheter
- Deflectable microcatheter



Jailed wire



## Troubleshooting



Preshaped wires  
CTO wires



Angulated  
microcatheter

### Active protection



Jailed balloon



Balloon-stent kissing



Modified



Semi-inflated



Jailed Corsair

### Risk factors:

- Plaque on the same side of the SB
- Reduced TIMI flow at the SB
- Severe % DS of bifurcation core  $\geq 70\%$
- Unfavourable bifurcation angle  $\geq 90^\circ$
- High ratio MV/SB  $\geq 2$
- Severe % DS at SB  $\geq 90\%$
- Spiky carina
- RESOLVE score  $> 10$



Deflectable  
microcatheter

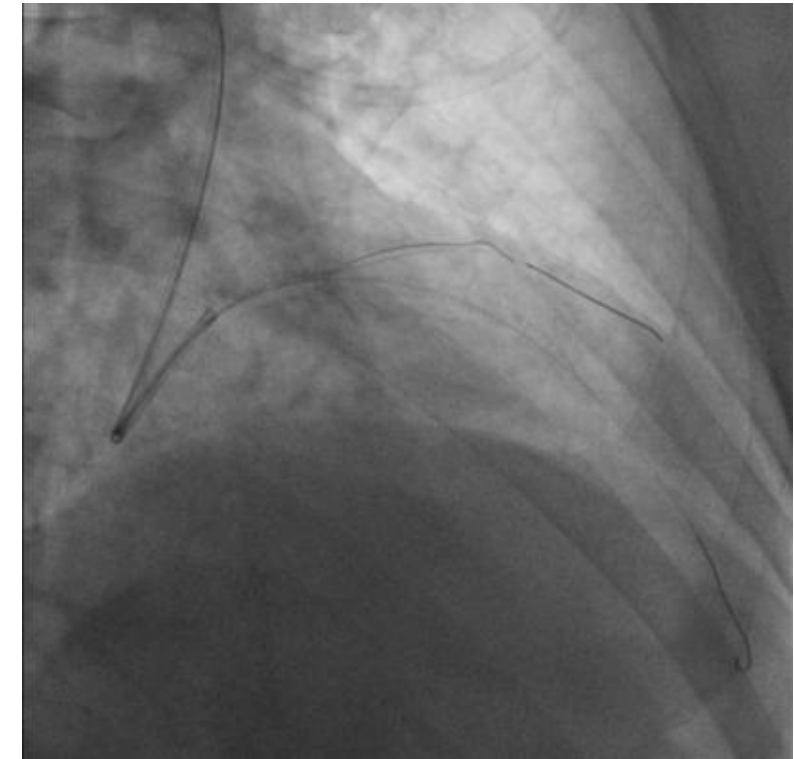
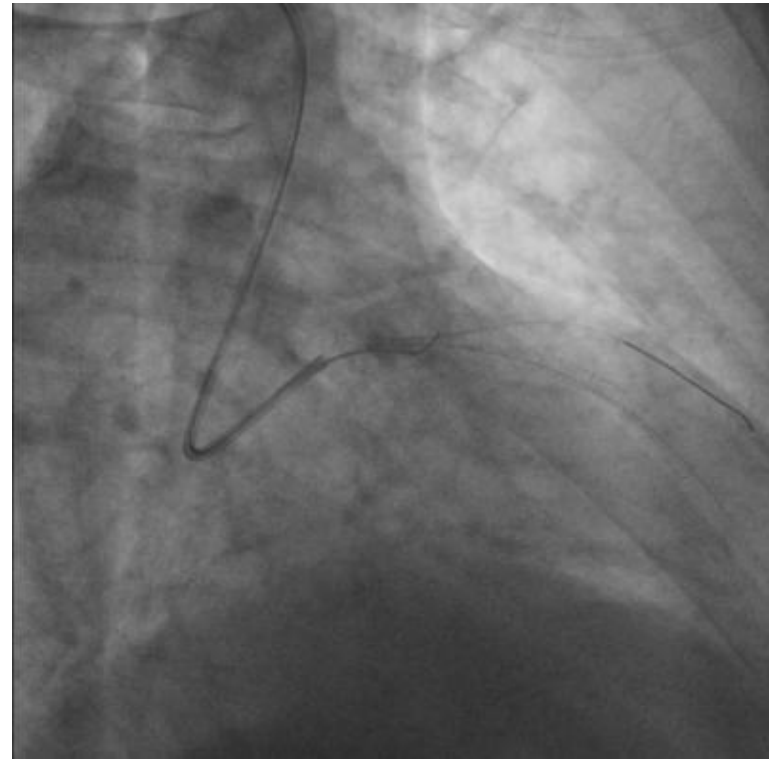
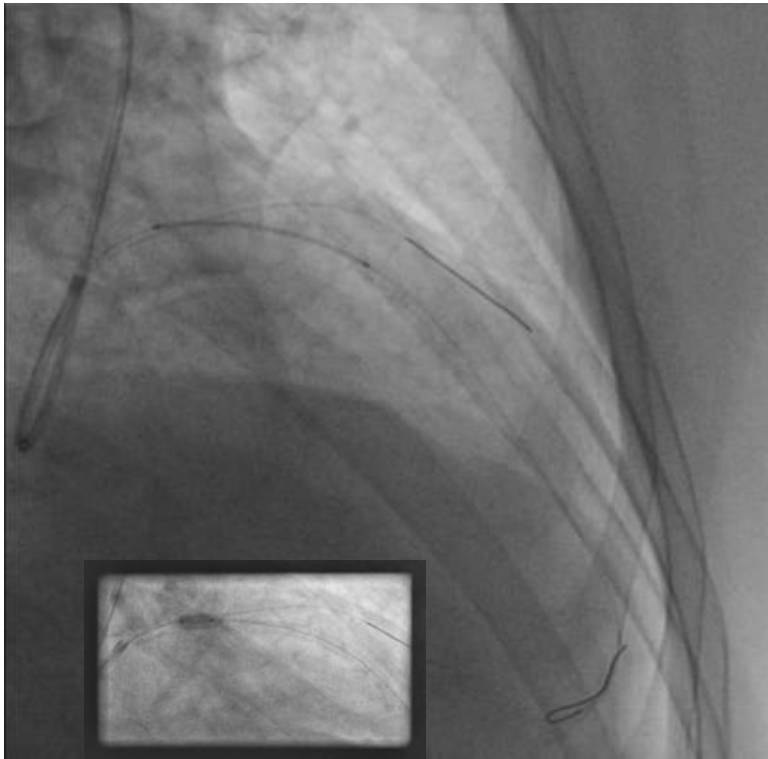


Rescue  
jailed balloon

CTO: chronic total occlusion; DS: diameter stenosis; MV: main vessel; RESOLVE: Risk prEdiction of Side branch OccLusion in coronary bifurcation intervention; SB: side branch; TIMI: Thrombolysis in Myocardial Infarction

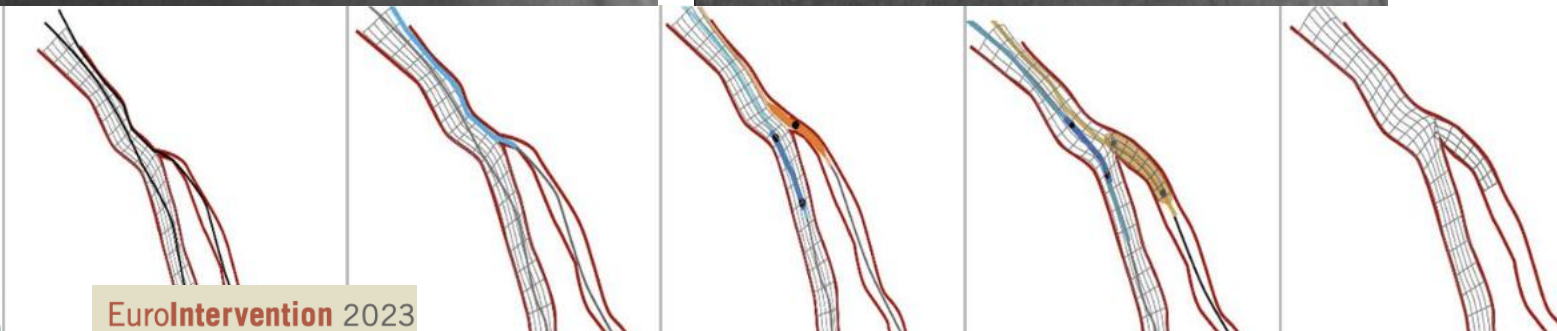
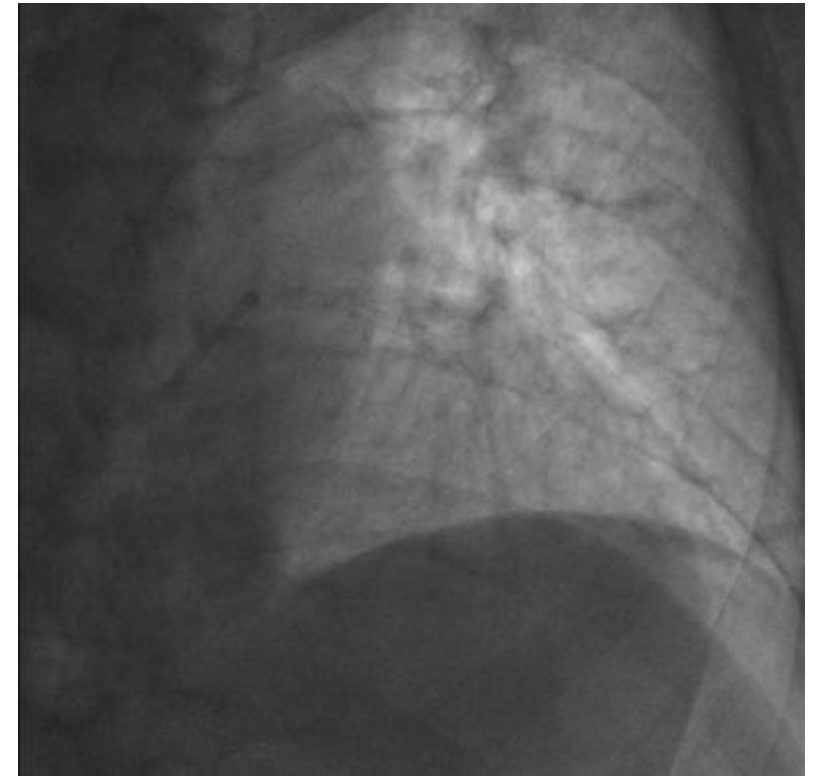
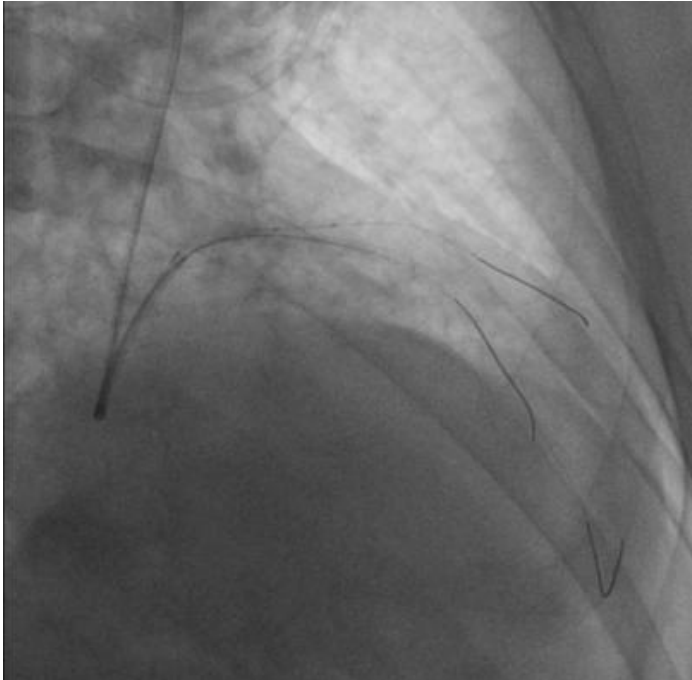
# Préserver un branche fille

T-Provisional. Carina shift/POT. Dissection /guidewire hydrophile



# Préserver un branche fille

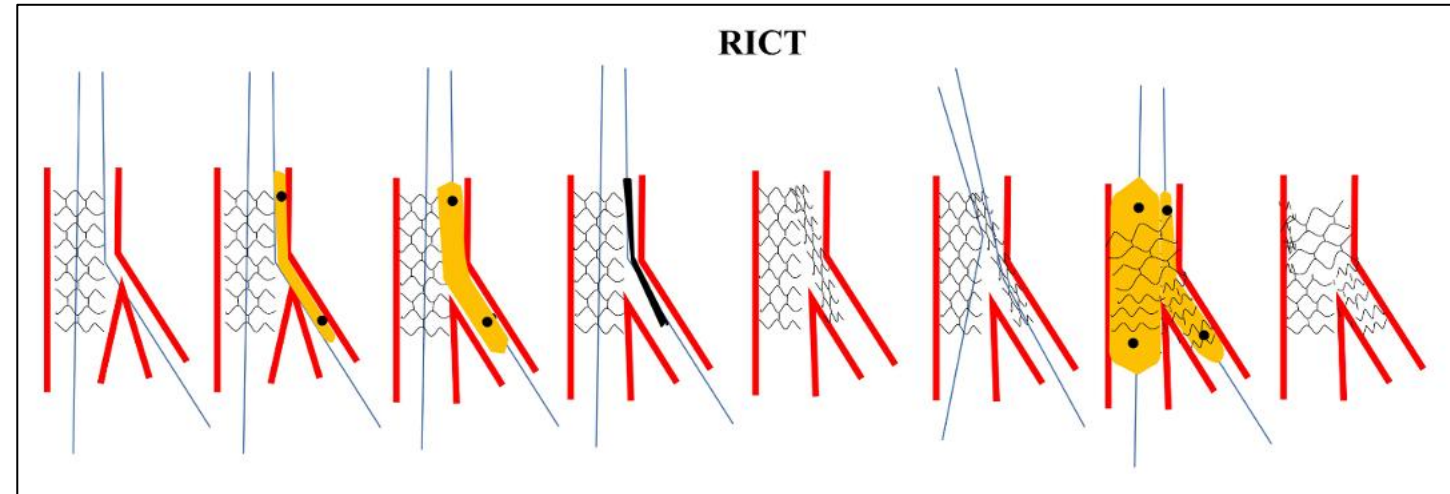
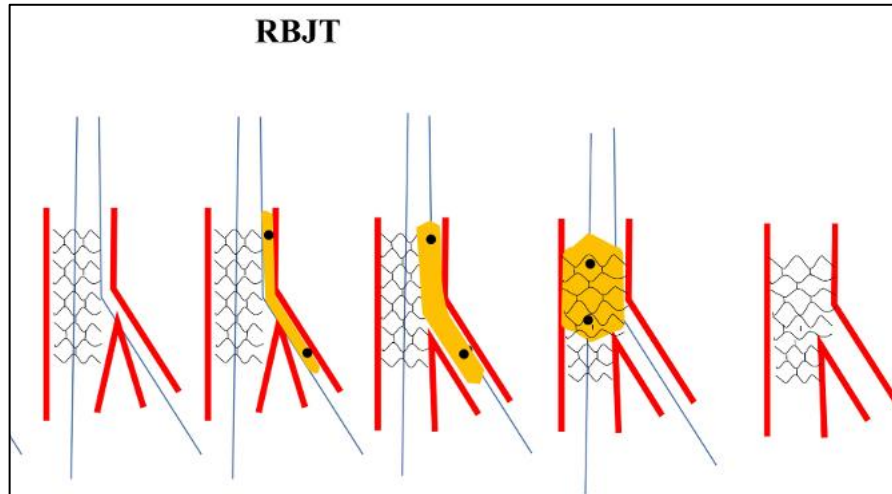
## Balloon rescue jailed technique



# Préserver un branche fille

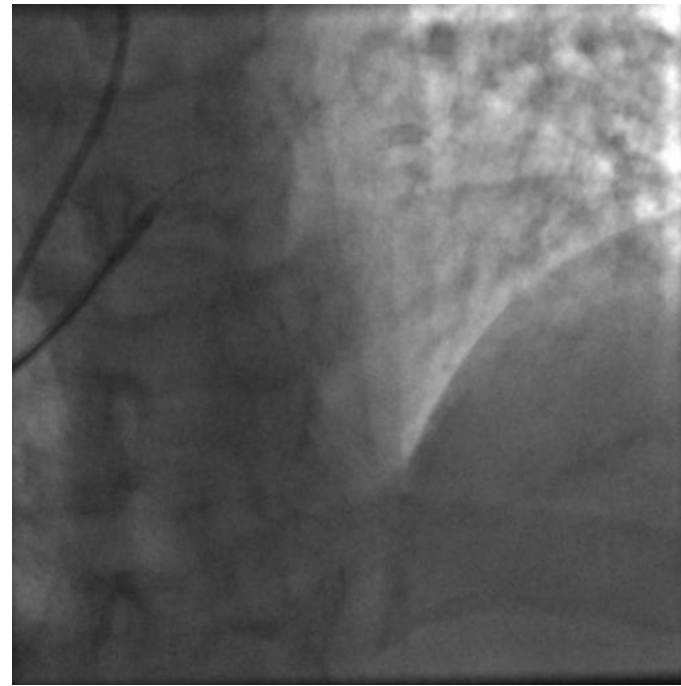
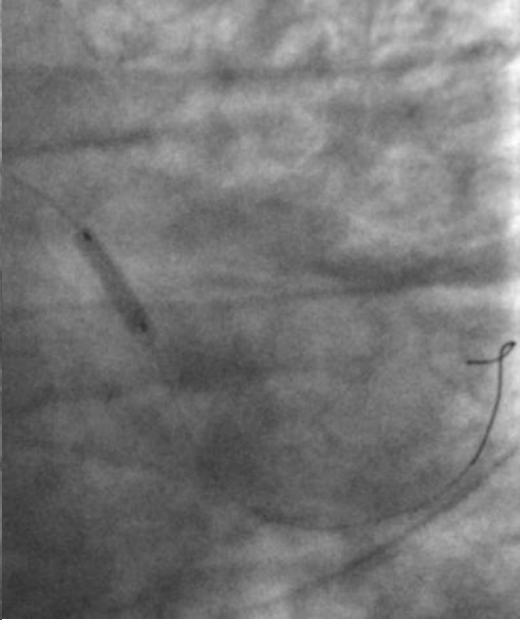
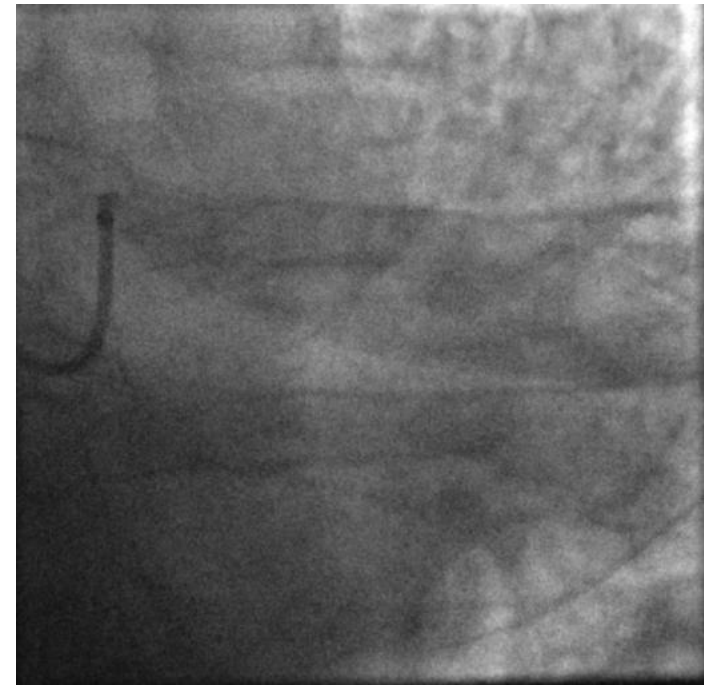
## Review of Techniques for Protecting Side Branch from Occlusion during Provisional Stenting in Coronary Bifurcation Lesions

*Rev. Cardiovasc. Med.* 2023; 24(11): 323

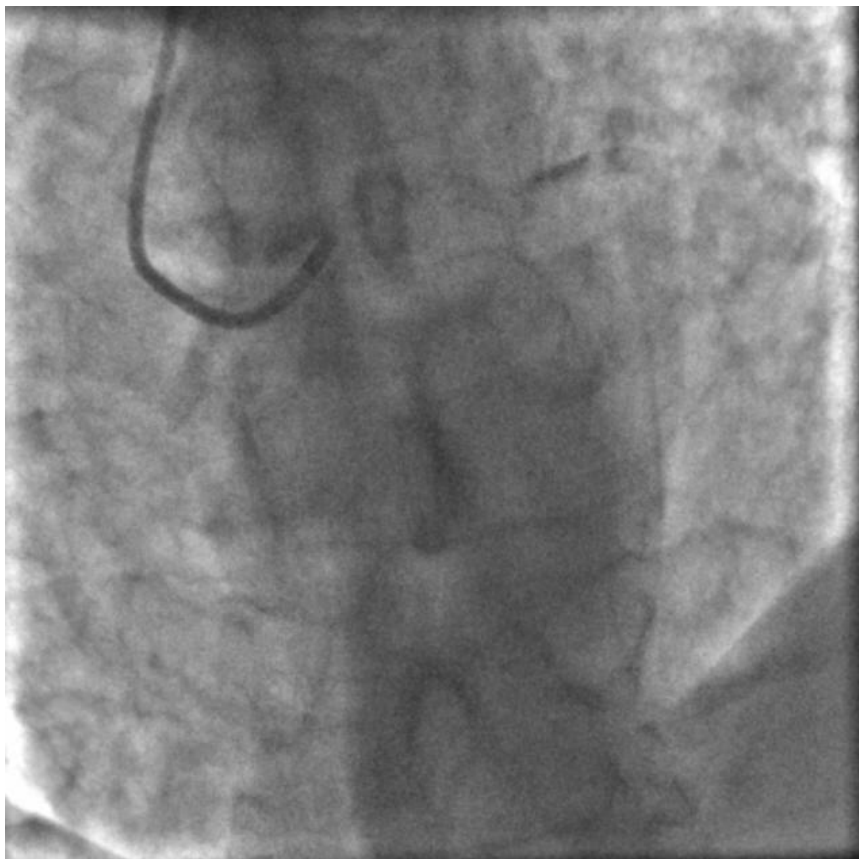


- Rescue Balloon Jailed Technique, si besoin microcatheter puis petit balloon
- Rescue Inverted Crush Technique : en cas de longue dissection de branche

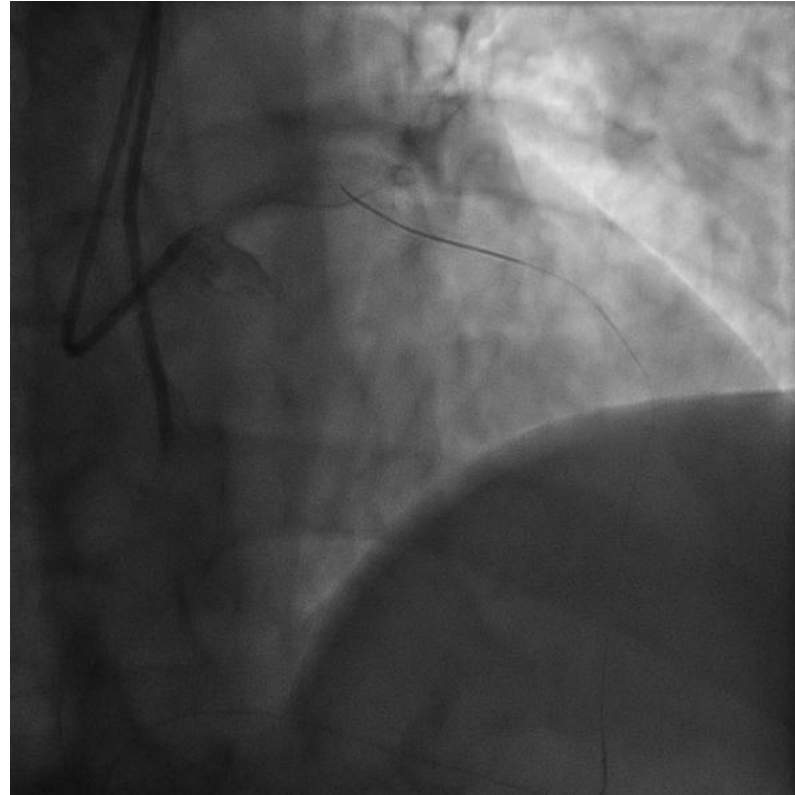
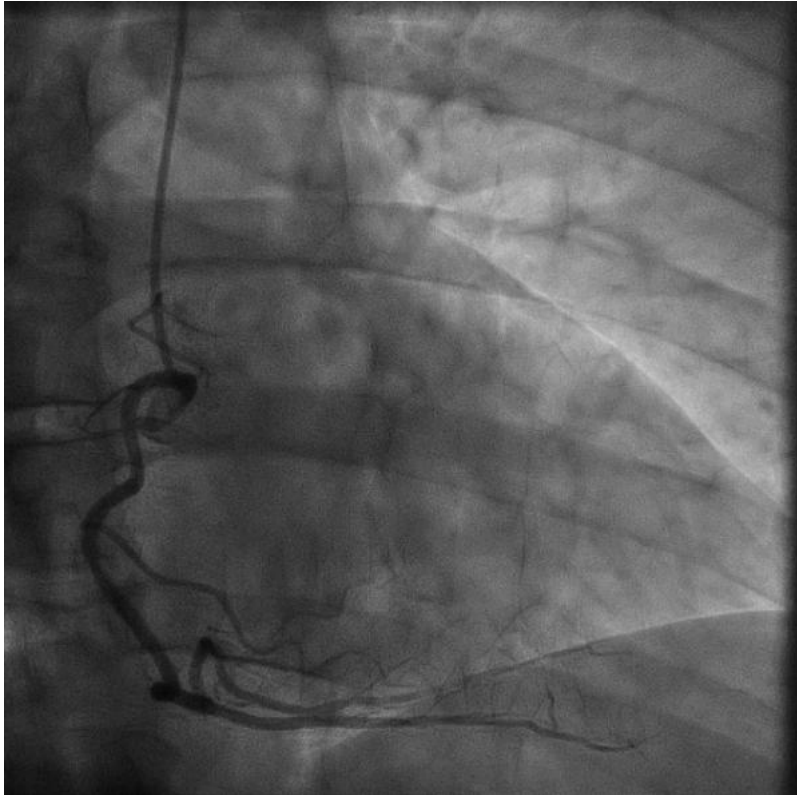
# Dissection et technique rétrograde



# Dissection TCG et technique rétrograde

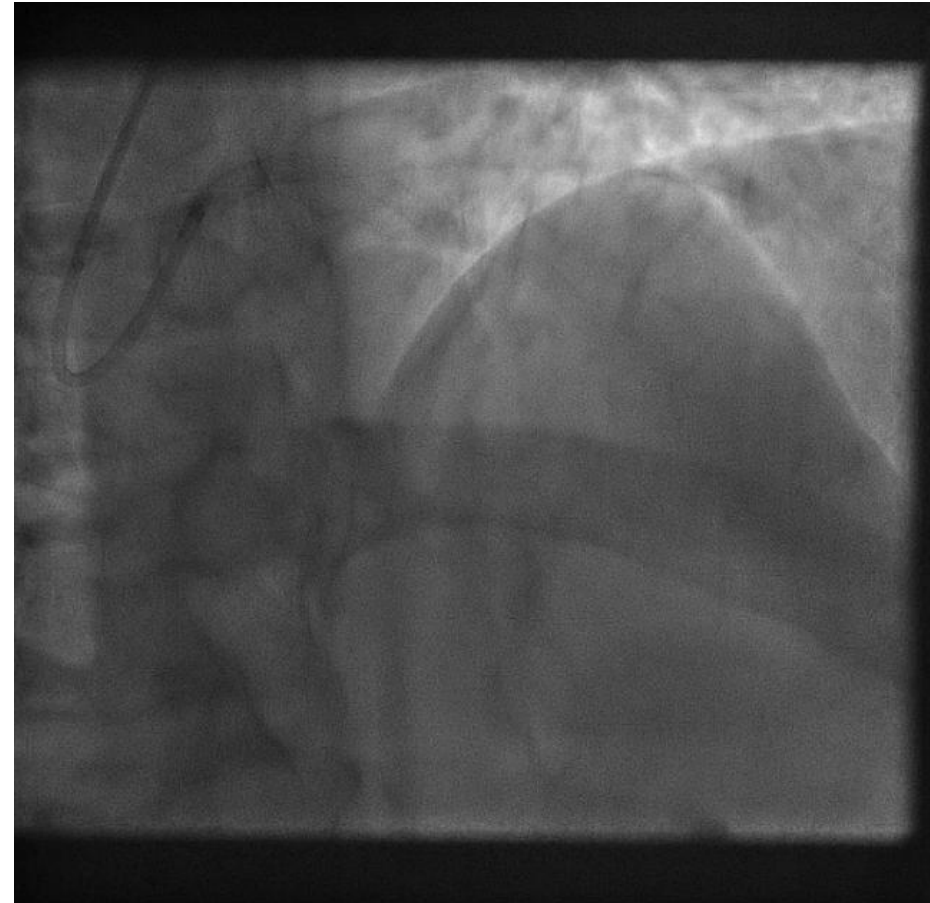
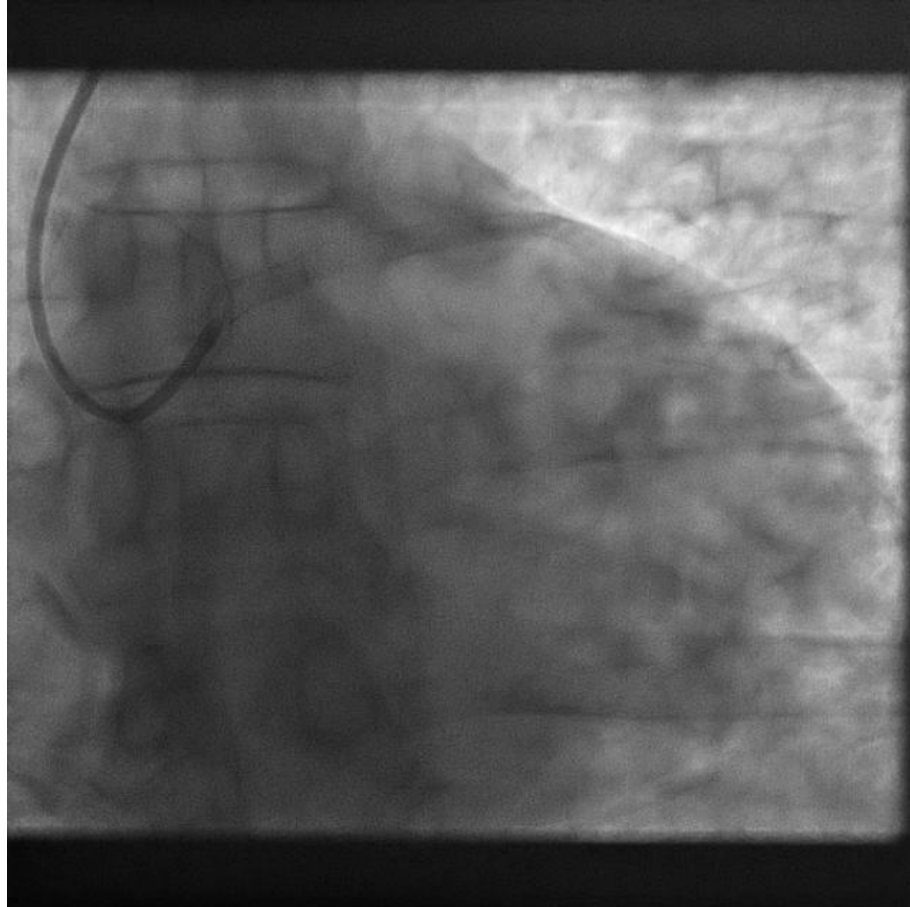


# Dissection et technique rétrograde



Abord rétrograde

# Dissection et technique rétrograde



# Techniques et outils CTO pour lésions complexes

- **Franchissement des lésions complexes/ échanges de matériel**
- **Guidewires, microcathéters, ballons, extensions de cathéter**
- **Gestion et contrôle des dissections**
- **Stratégies initiales... (exemple des bifurcations): rester simple et anticiper**
- **Imagerie directe / IVUS: (analyse, apprentissage)**