

Case report:  
"Context for Change"  
Clinical forum in  
complex coronary  
intervention

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# Paziente

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- ✓ Maschio
- ✓ 49 anni
- ✓ Iperteso, fumatore, dislipidemico, familiarità per CAD.
- ✓ Da vari giorni angina da sforzo
- ✓ Insorgenza di intenso dolore retrosternale e sudorazione da circa 1H
- ✓ ST up V2-V6, AVL, D2.



## TERAPIA PRATICATA

- Brilique 180 mg cp
- Flectadol 250 mg ev
- Morfina 10 mg ev
- Pantorc 40 mg ev
- KCl 40 mEq in 500cc NaCl a 40 ml/h

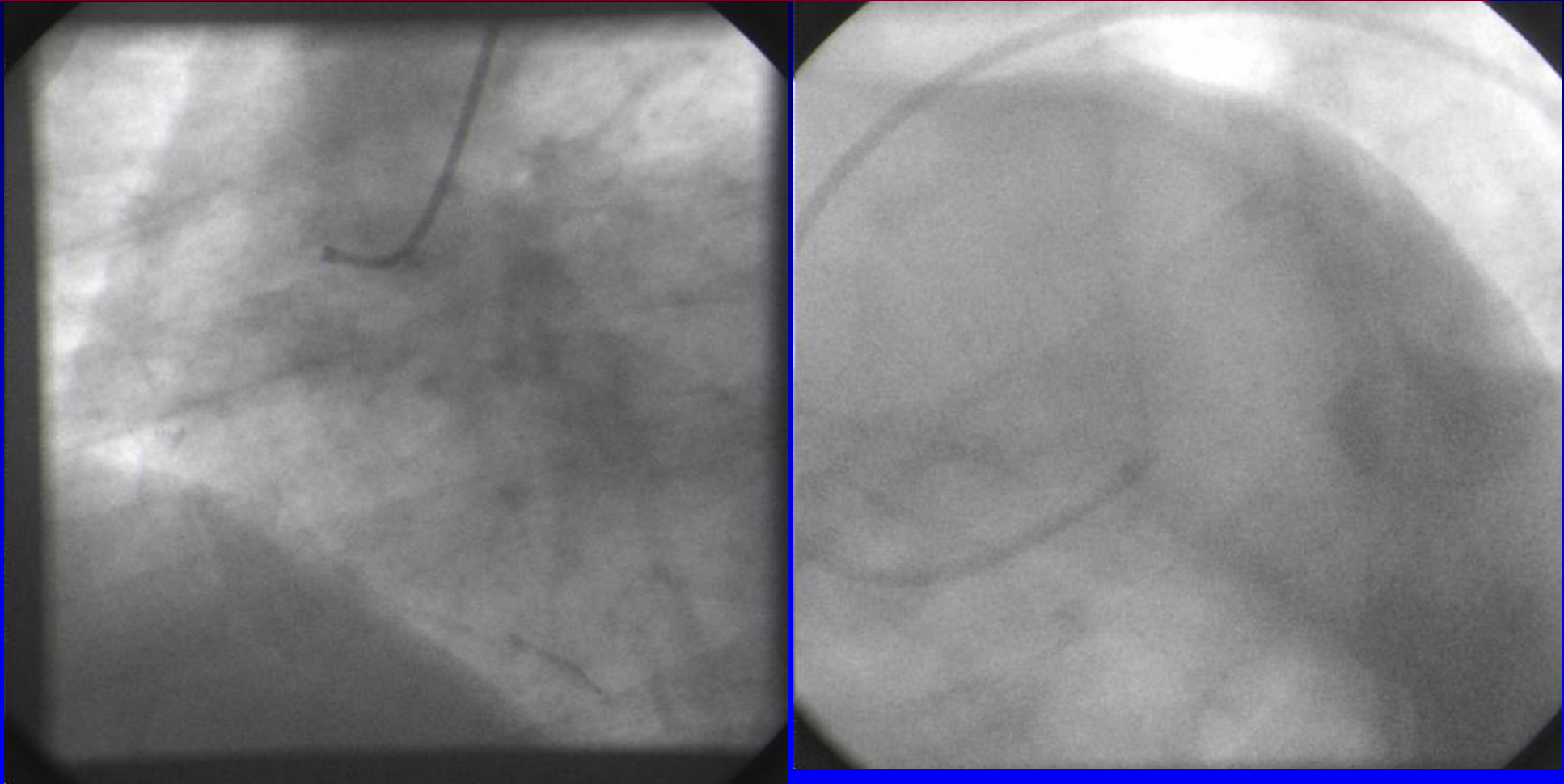


Episodio FV regredito con DC Shock a 200 J



# Coronary angiography

Coronary angiography performed via right femoral artery through a 6 French sheath.

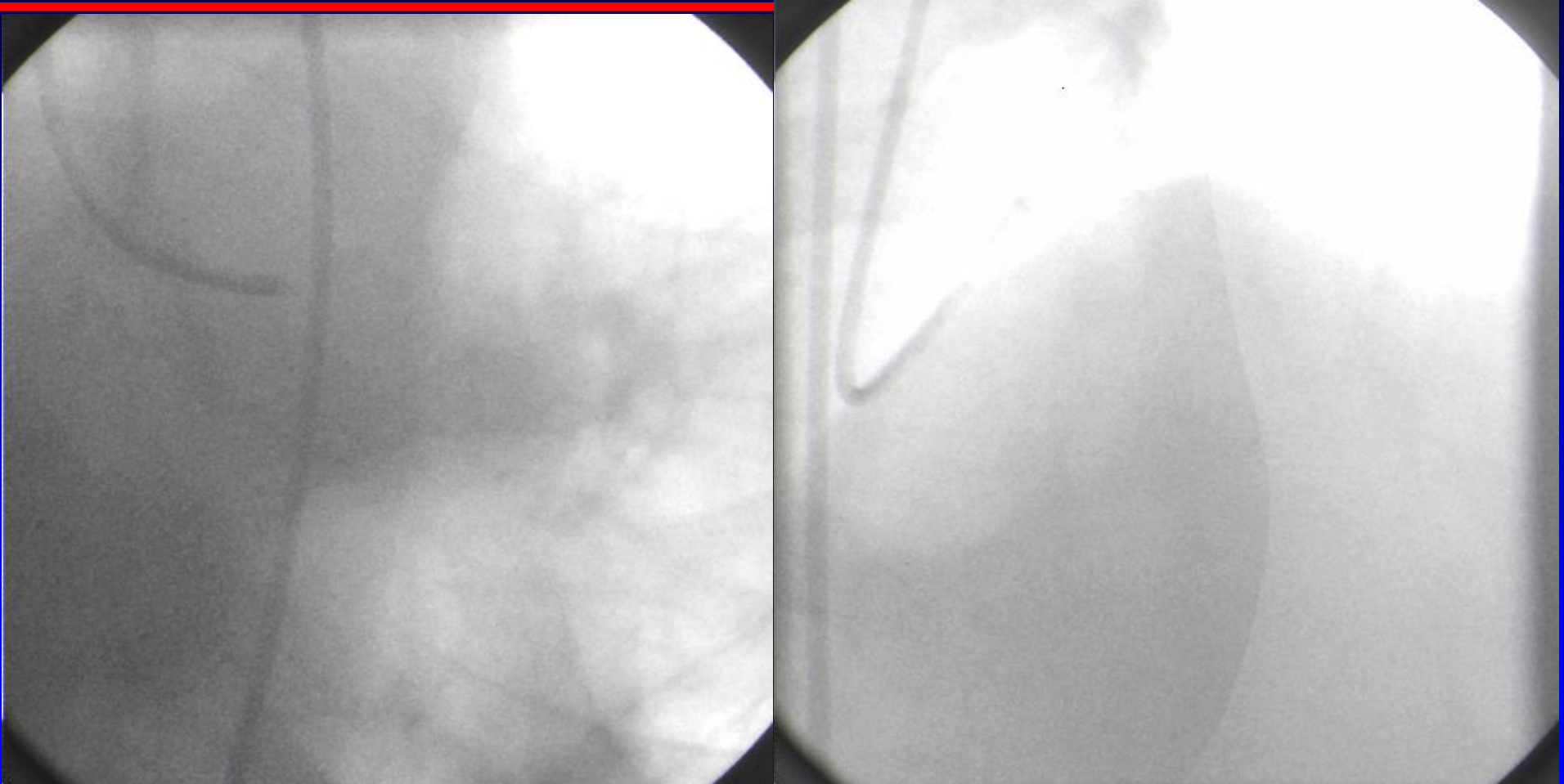


**CTO Dx II- Severe and diffuse disease of LEFT MAIN, involving bifurcation with ostium of circumflex and left anterior descending coronary artery (LAD). Occlusion of LAD II (TIMI 0).**



# Coronary angiography

Coronary angiography performed via right femoral artery through a 6 French sheath.



**CTO Dx II. Severe and diffuse disease of LEFT MAIN, involving bifurcation with ostium of circumflex and left anterior descending coronary artery (LAD). Occlusion of LAD II (TIMI 0). I diag subocclusive. I-II MO with ostial subocclusive lesions.**

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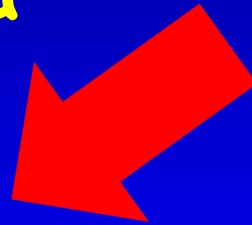
# Cosa fare dopo la coronarografia?

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a. PCI IVA

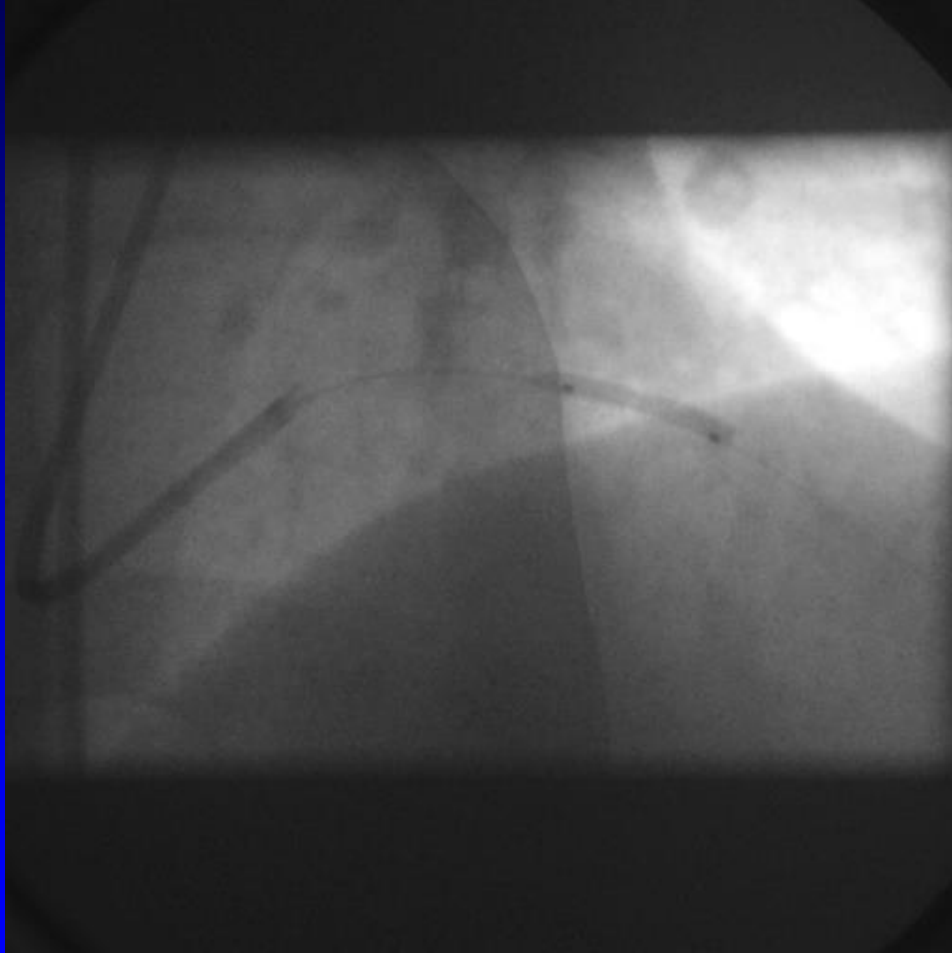
b. PCI IVA + Chirurgia

c. PCI TC-IVA-CX



# LAD II PCI

Extra Backup 4.0 guiding catheter + Heparin 6000 UI iv. (ACT: 300s)



A Balance Middle Weight (BMW) angioplasty guidewire was advanced to the distal LAD.



Then mid LAD is treated with direct stenting Synergy 3.0x28 mm





# POST PCI

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## Dopo rivascularizzazione di DA:

- Pz agitato, dispnoico, con sudorazione profusa
- Rapido deterioramento emodinamico (PA media 60 mmHg) e sviluppo di EPA.
- Richiesto supporto anestesilogico, che ritiene necessario praticare IOT del pz.

Consulto collegiale con CCH: Si decide di proseguire mediante PTCA TC-DA-CX.

Reperito AFS 8F, e successivo posizionamento di IABP 1:1





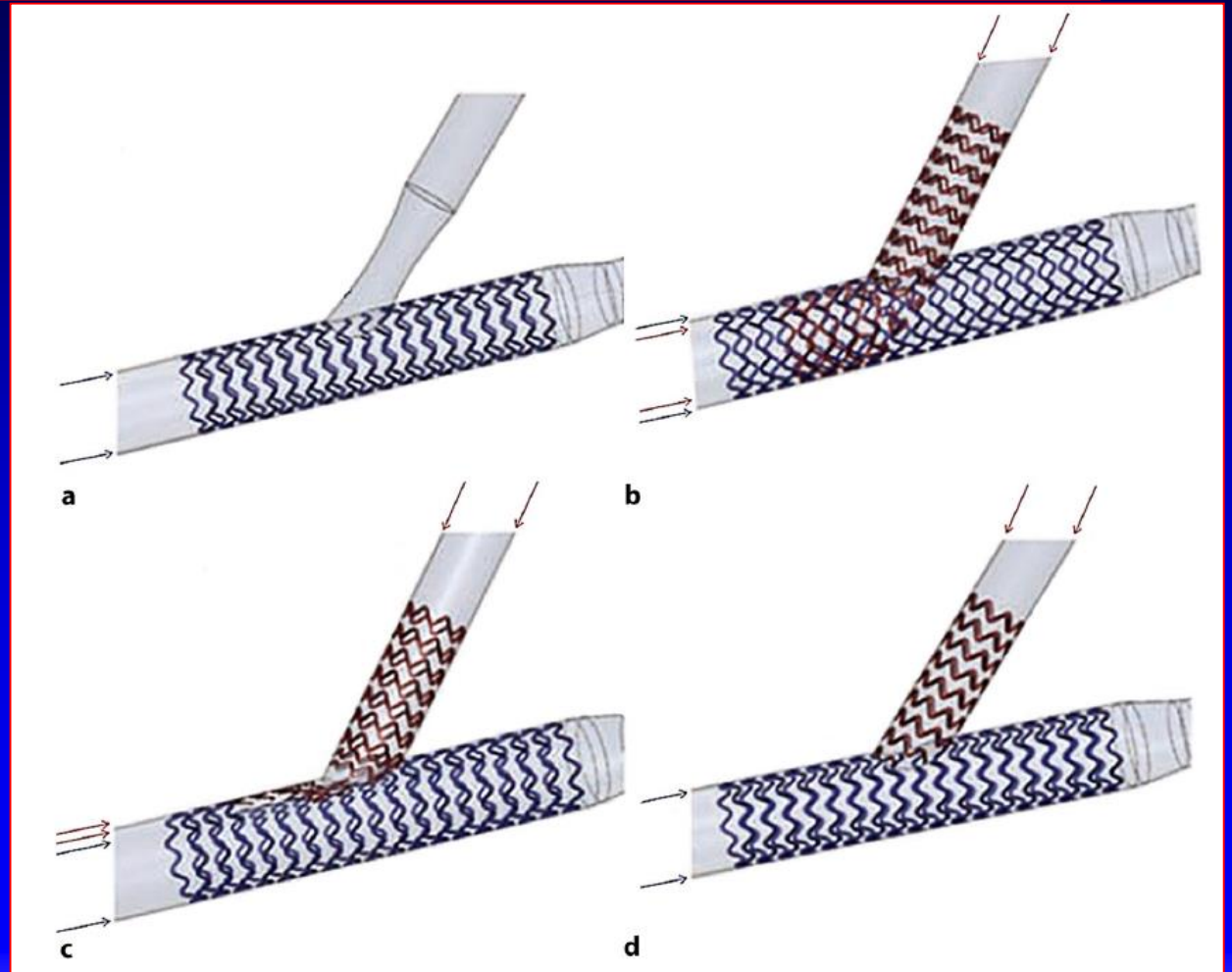
# Quale tecnica utilizzare ?

a. Provisional

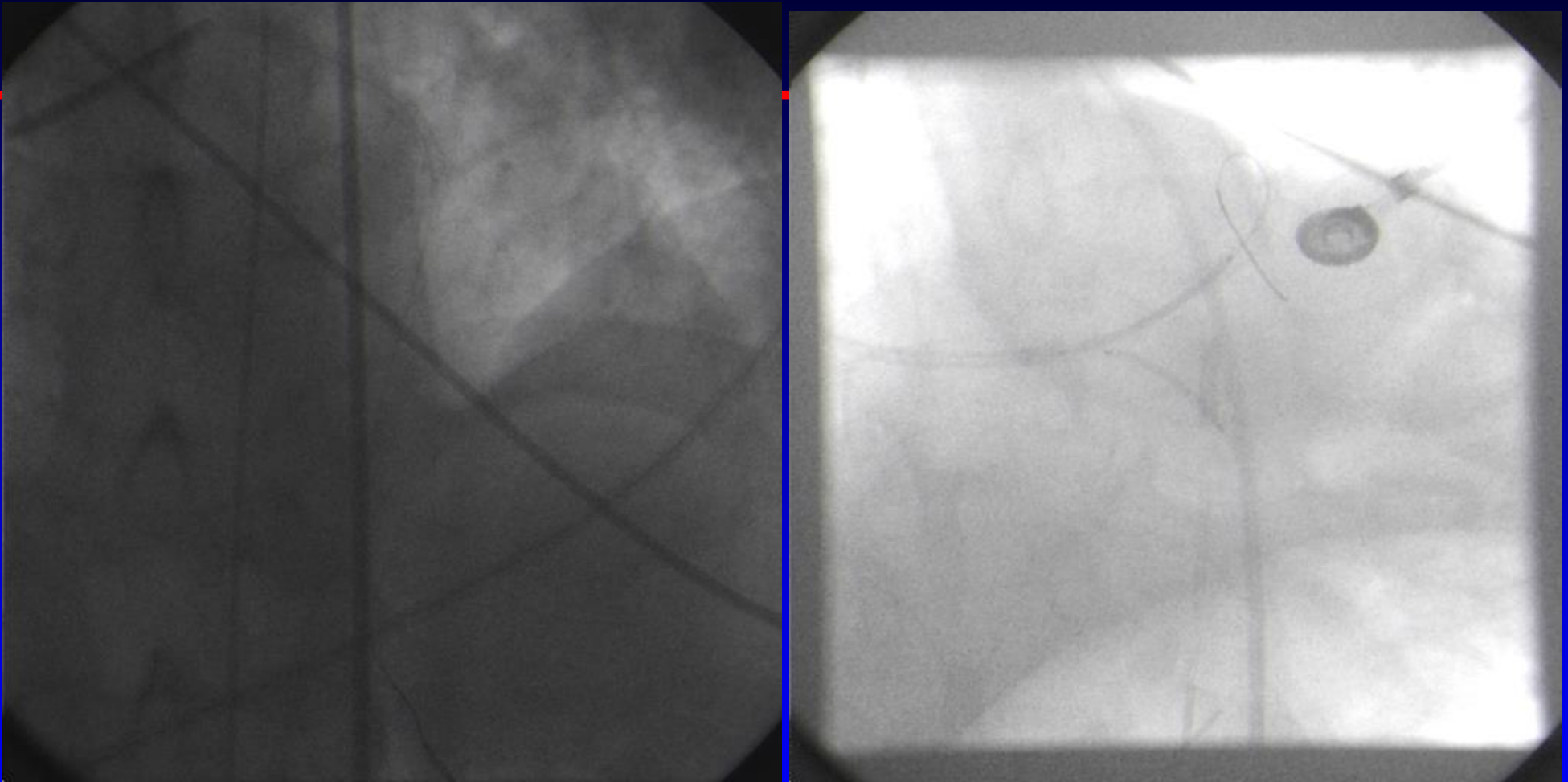
b. Culotte

c. Crush

d. T-stenting



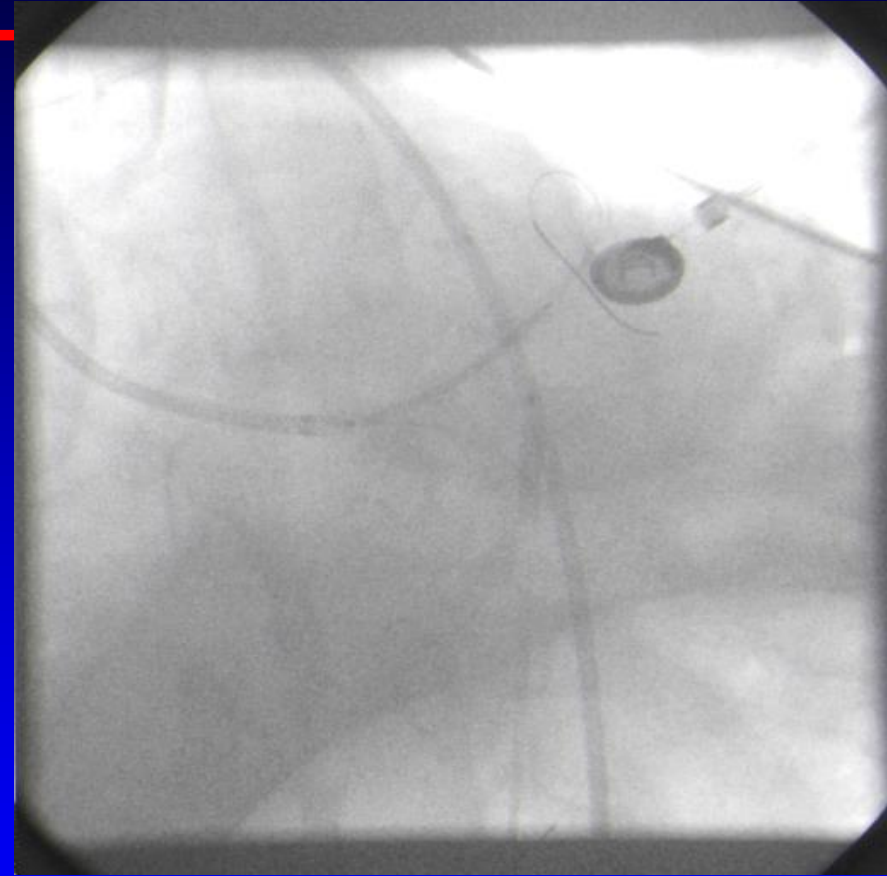
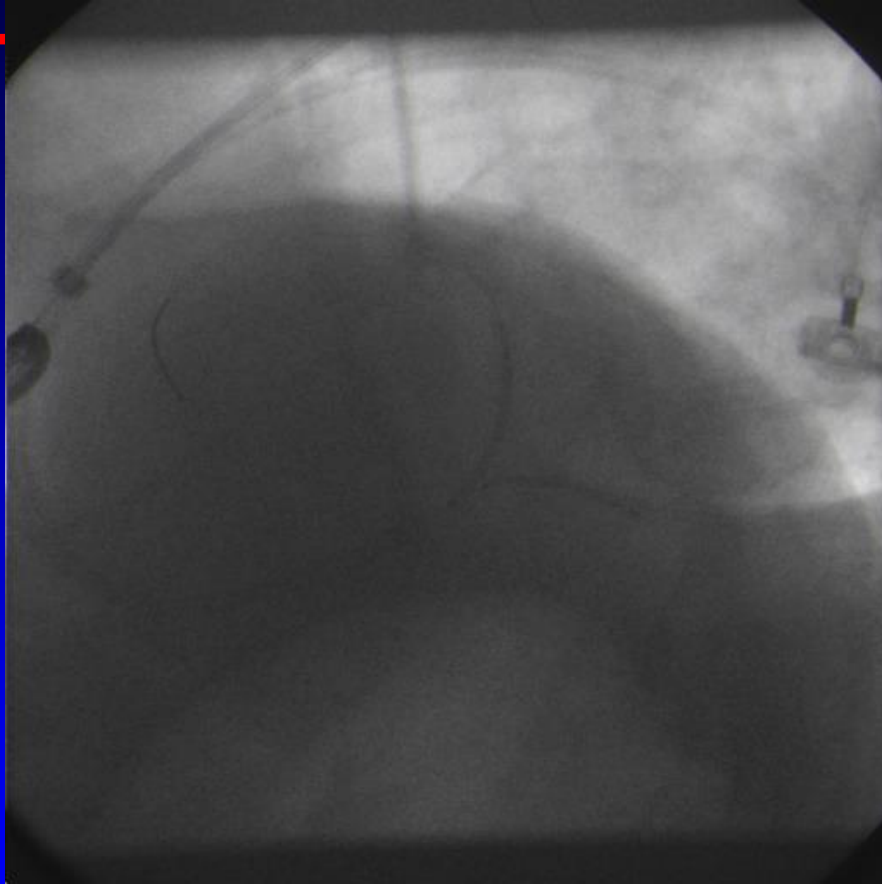
# PTCA TC divisionale-CX-DA



- Dopo preparazione della DA ostiale mediante dilatazione con catetere a palloncino 3x18 mm, viene crossata seconda guida BMW su Cx.
- Posizionamento di DES 3.5x15 mm all'ostio di CX e DES 3.5x26mm su TC-DA, con tecnica T-Stenting.



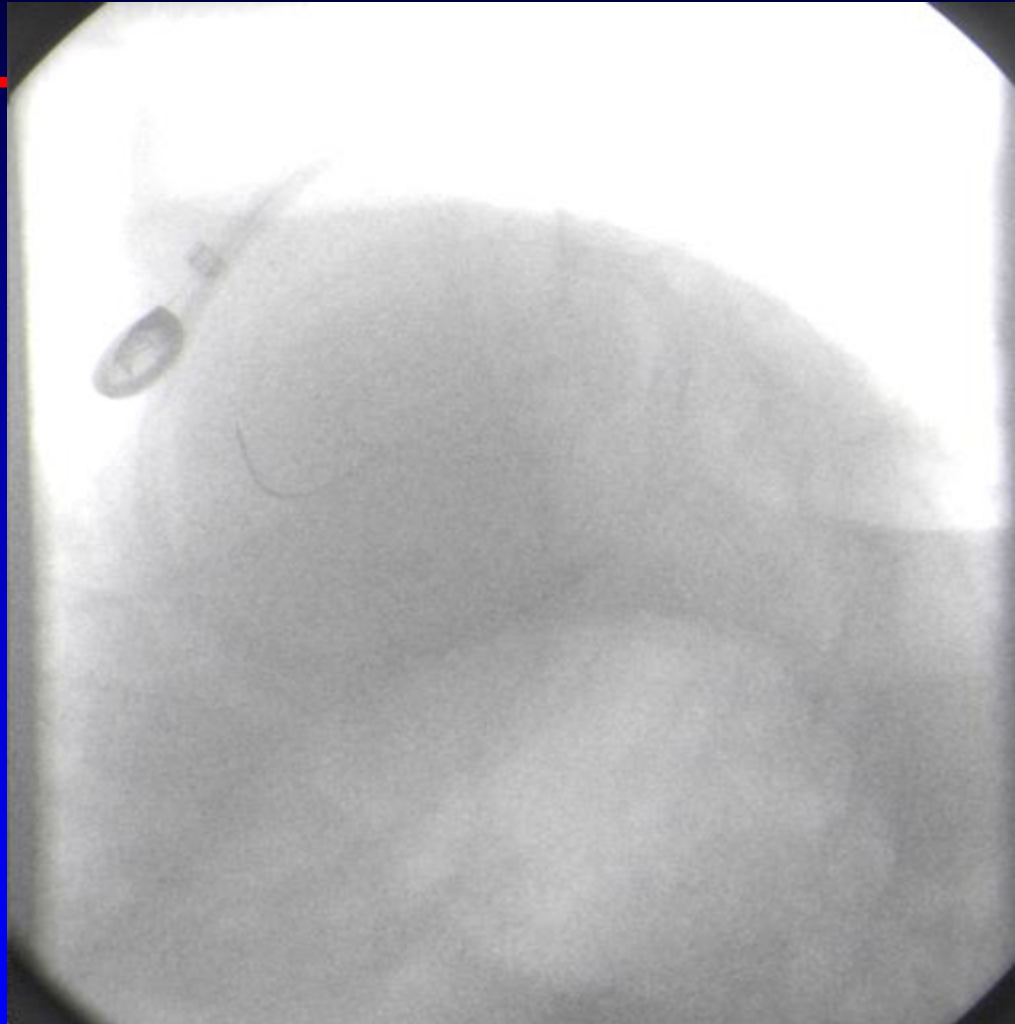
# PTCA TC divisionale-CX-DA



- Impianto di DES 3.5x15 mm su CX ostio-proximale con dilatazione a 16 atm.
- Successivo impianto, a 18 atm, di DES 3.5x26 mm TC-DA.



# PTCA TC divisionale-CX-DA



➤ Al termine della procedura, ecco il risultato finale.



# UTICC

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In terapia intensiva il pz giunge intubato, sedato.

-ECO: EF 38% acinesia apicale e medio-basale di setto, parete anteriore e settale. Ipocinesia dei segmenti rimanenti.

-PA 100/60 mmHg (in TP con Dopa 5 mcg/kg/min e Nora 150 ng/kg/min)

-Scambi respiratori scadenti, con FiO<sub>2</sub> 65%

-Parziale regressione del tratto ST.

Progressiva stabilizzazione, dopo 4 gg estubazione, rimosso IABP, graduale riduzione di supporto aminico.



# EVOLUZIONE

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Dopo una settimana, pz vigile e collaborante, lamenta forte dolore retrosternale e interscapolare.

AngioTC: esclusa patologia aortica

Angiografia coronarica:

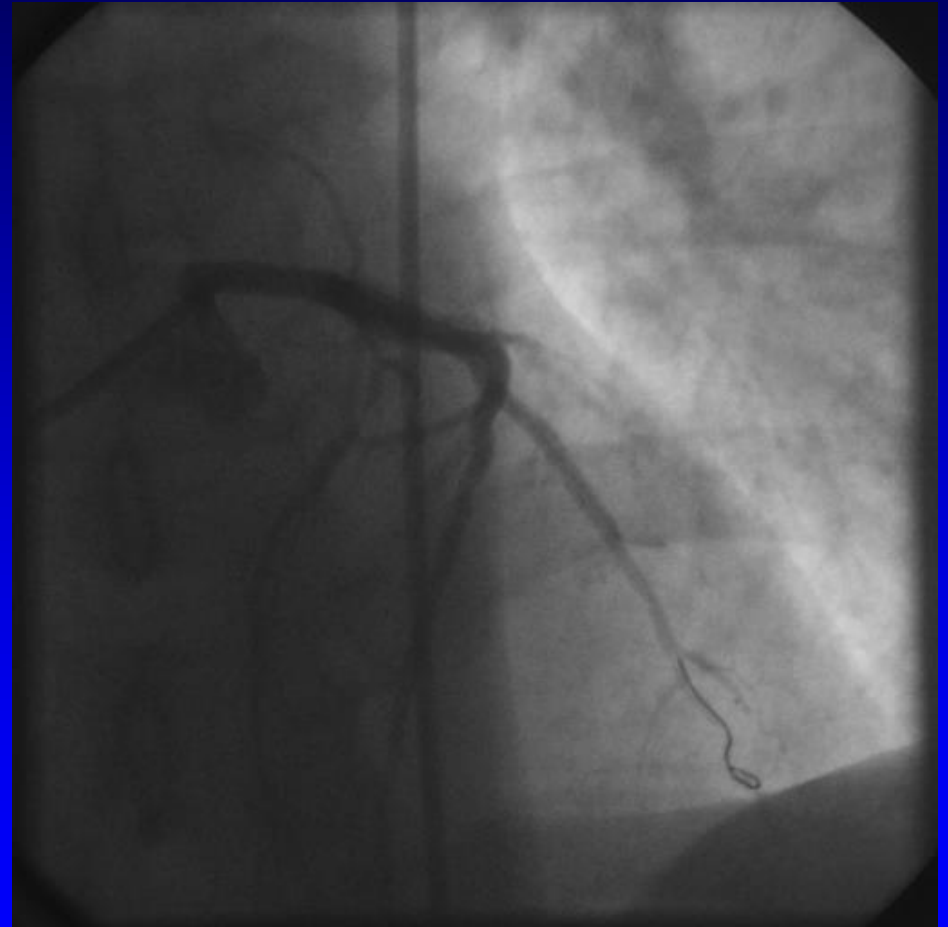
-Buon risultato di pregressa PTCA

TC-DA-Cx

-Stenosi subocclusiva di I diagonale:

PTCA+ 2 DES embricati (2.25X18mm

e 2.25x9 mm)



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PZ dimesso in data 12/5/18

Asintomatico per angor e dispnea.

EF 43%. Acinesia apicale, ipocinesia medio-basale pareti ant. e lat.

In programma disostruzione di A.coronaria dx.

MA DOPO 6 MESI

Pz torna in DEA per intenso dolore retrosternale

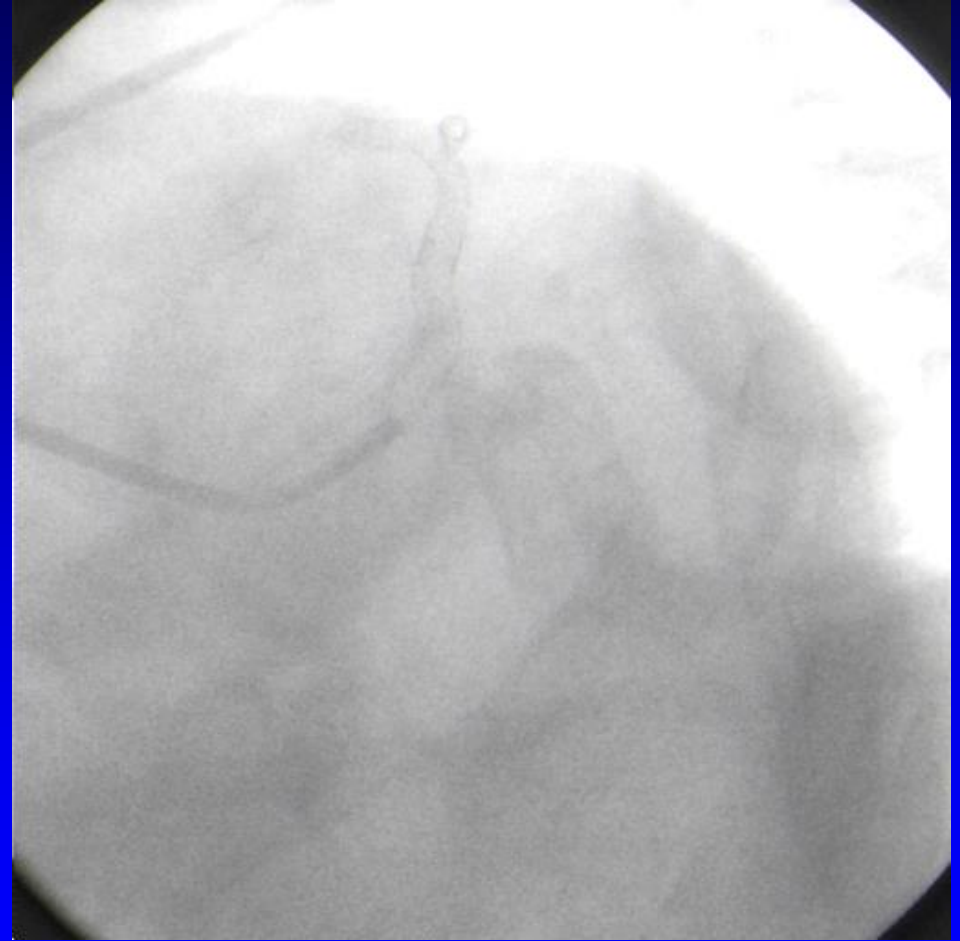
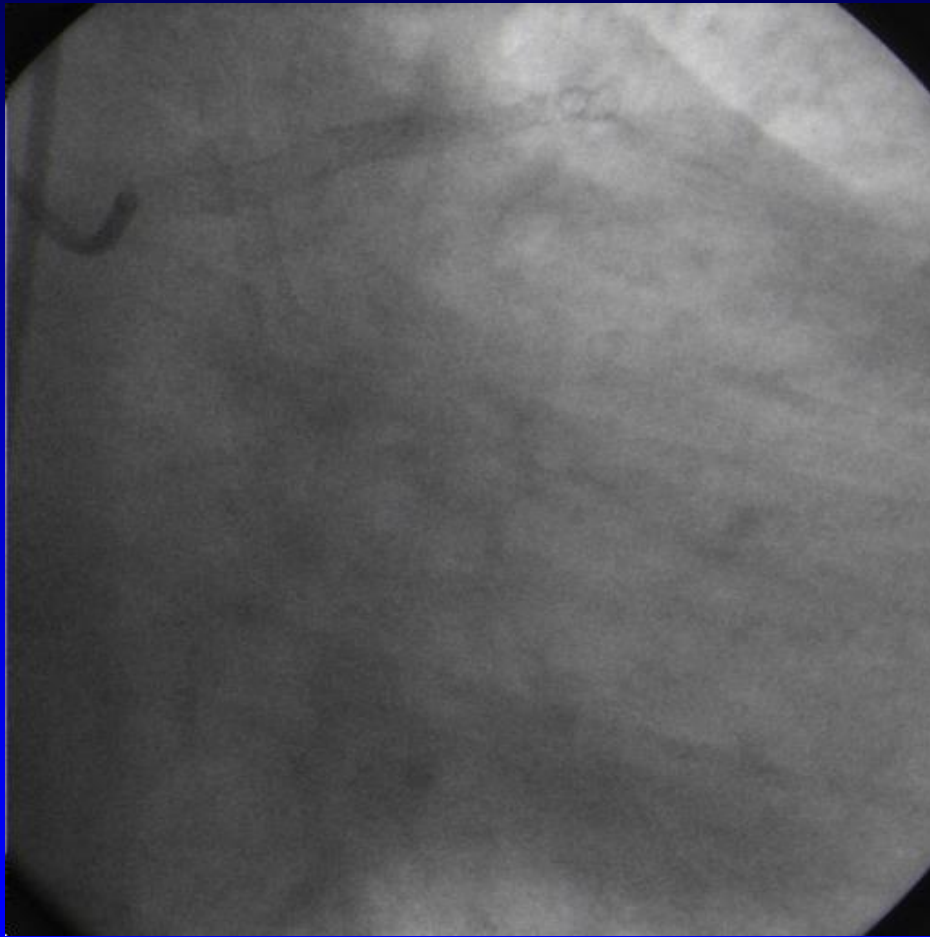
ECG: Q V4-V6, ST up V3-V6.

TnI-HS e CK-MB elevate.





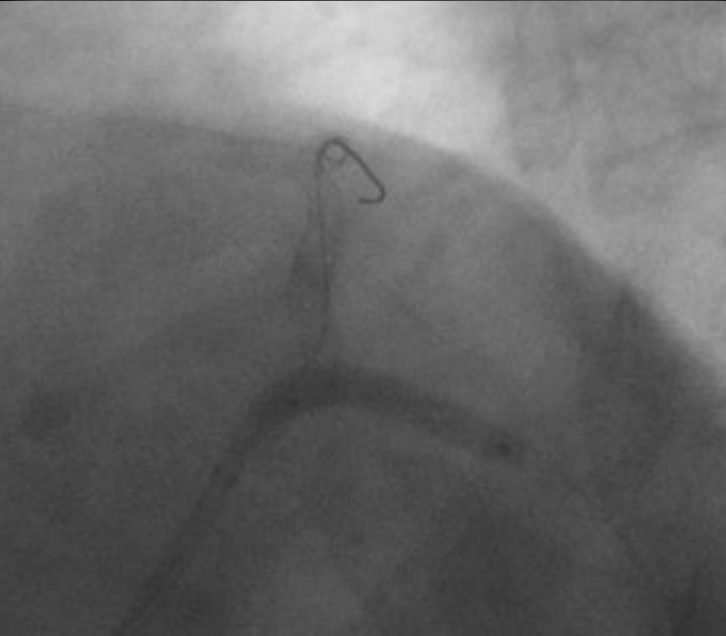
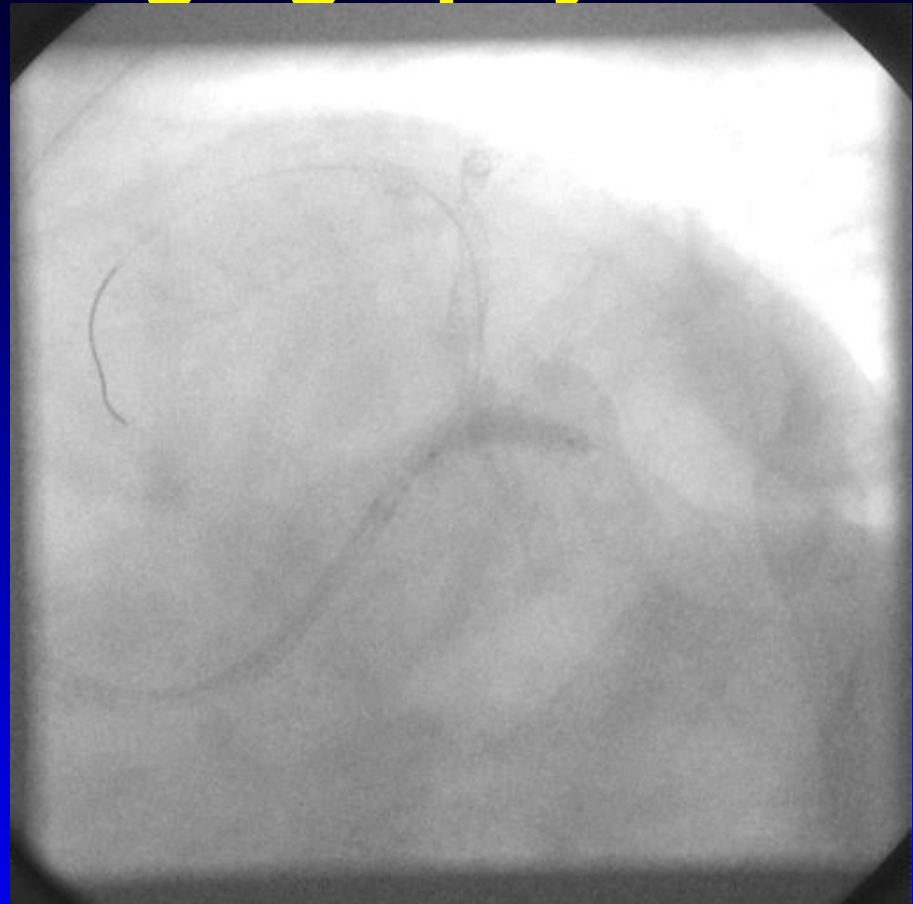
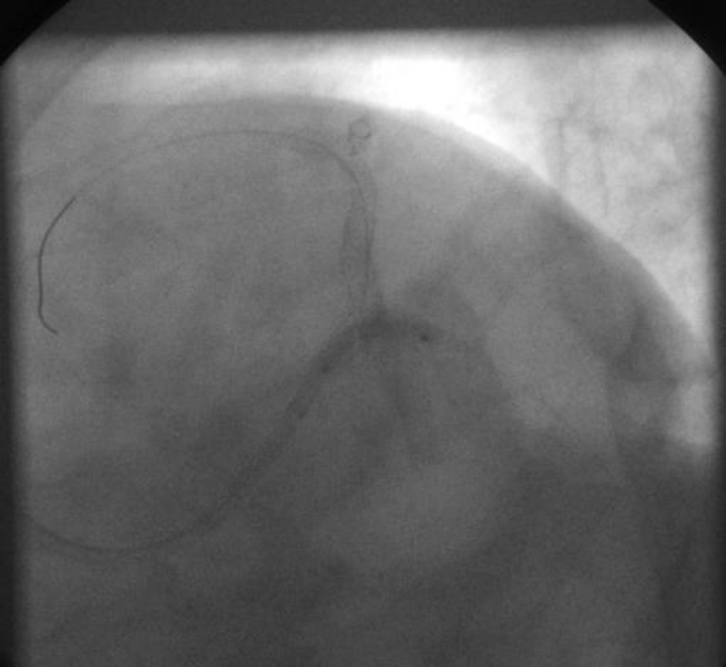
# Coronary angiography



Stenosi subocclusiva ostiale intrastent su CX. Restenosi non critica su DA ostiale intrastent, buon risultato di pregresse PTCA su DA media e DG1



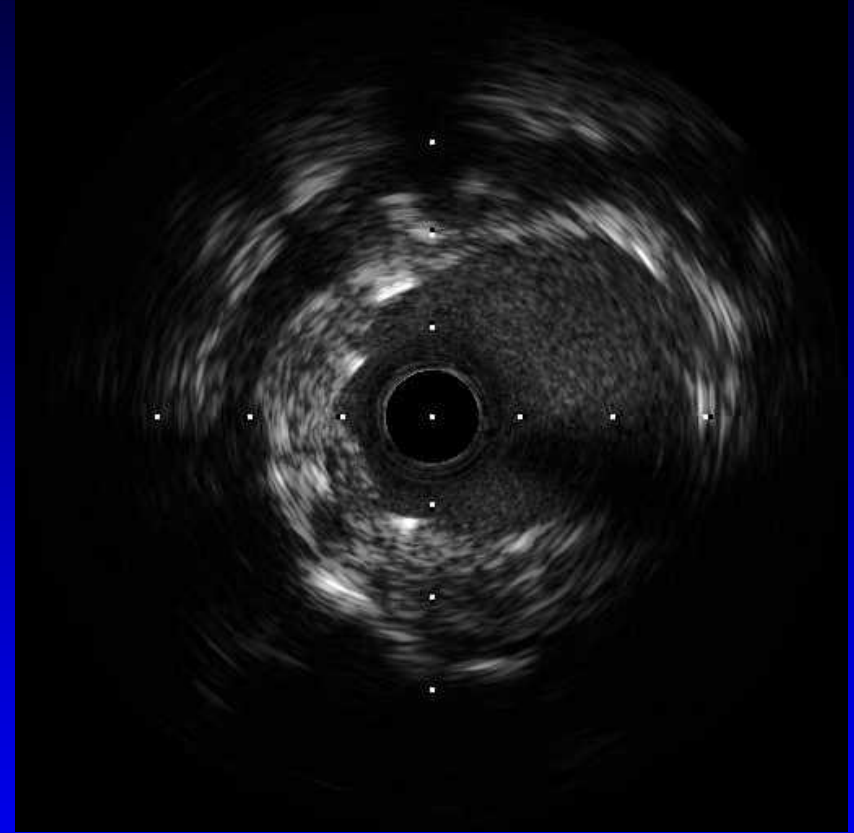
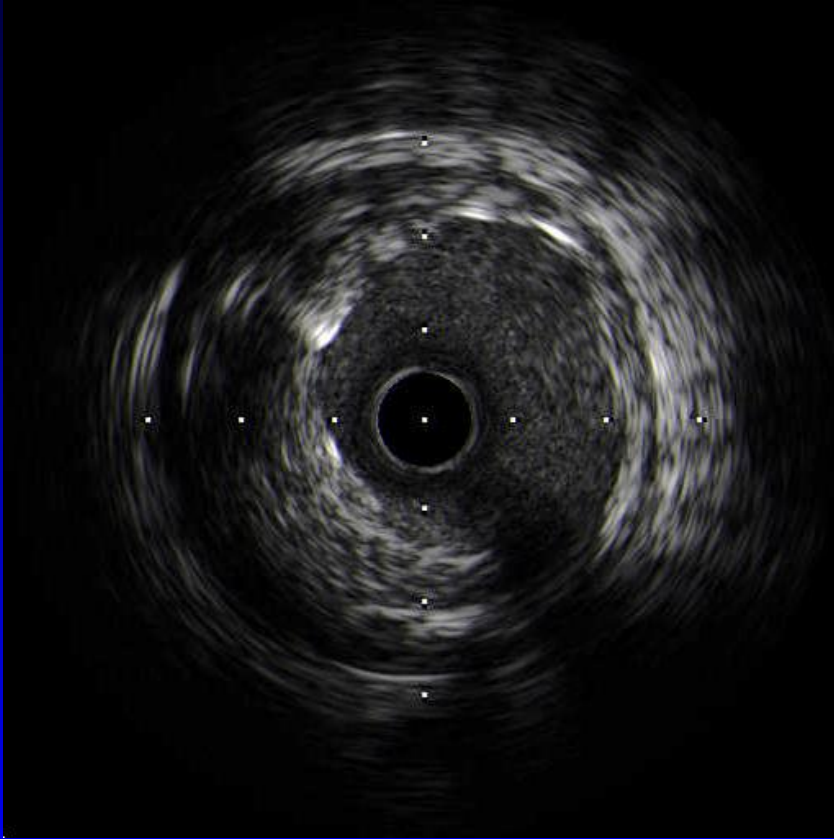
# Coronary angiography



**Progressiva predilatazione con palloni  
di calibro crescente:  
2x15 mm, 2.5x20mm e 3x20mm a 18 atm.**



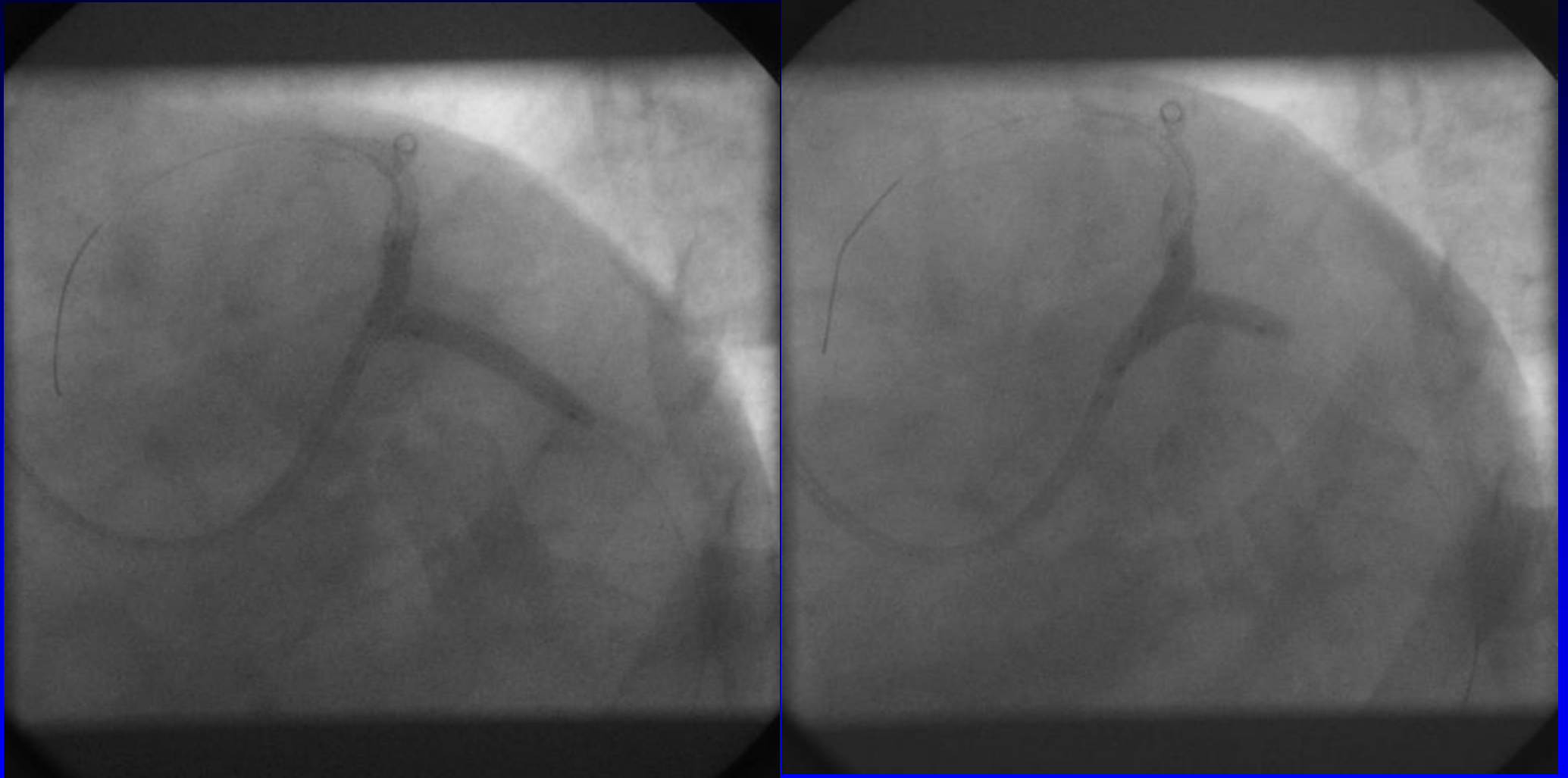
# IVUS



**IVUS su DA-TC: si evidenzia stenosi non critica su DA ostiale, a livello del tronco divisionale. Si evidenziano le maglie dello stent impiantato sulla Cx a coprirne l'ostio. TC esente da restenosi**

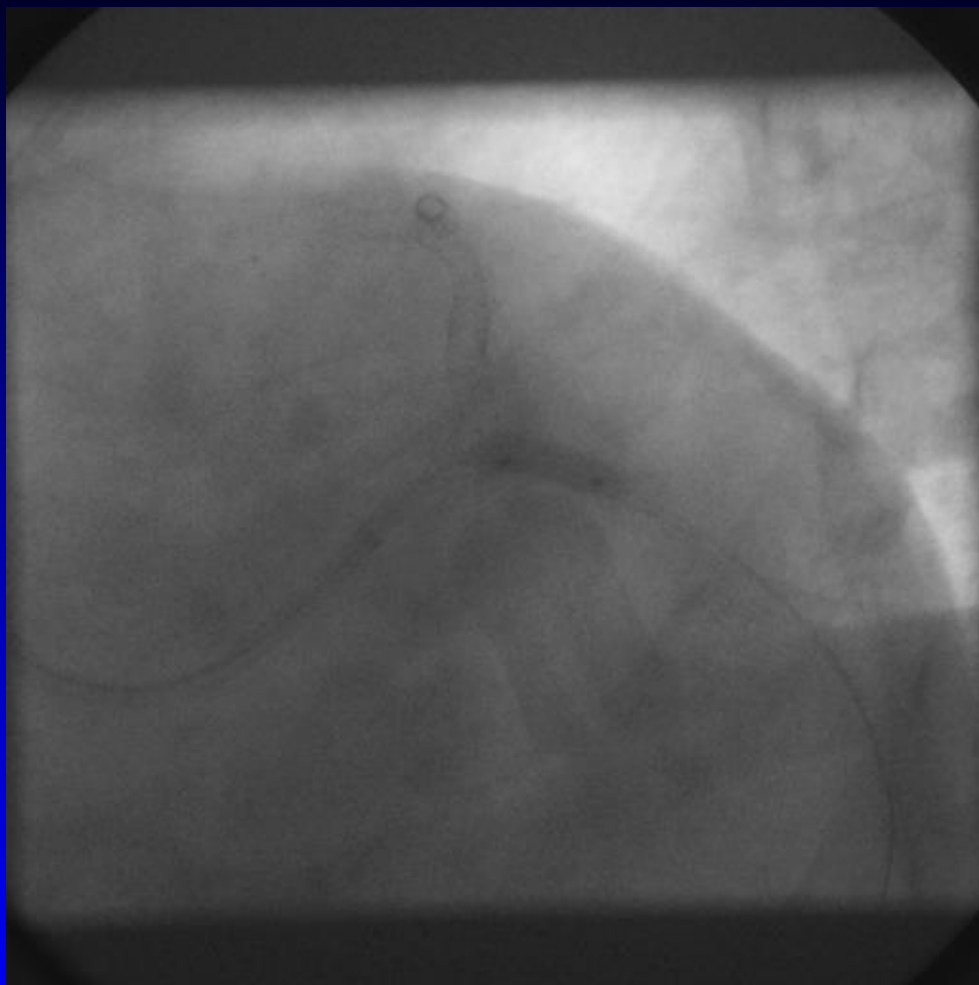


# Coronary angiography



Kissing balloon con due Euphora 3x15 mm a 20 atm.



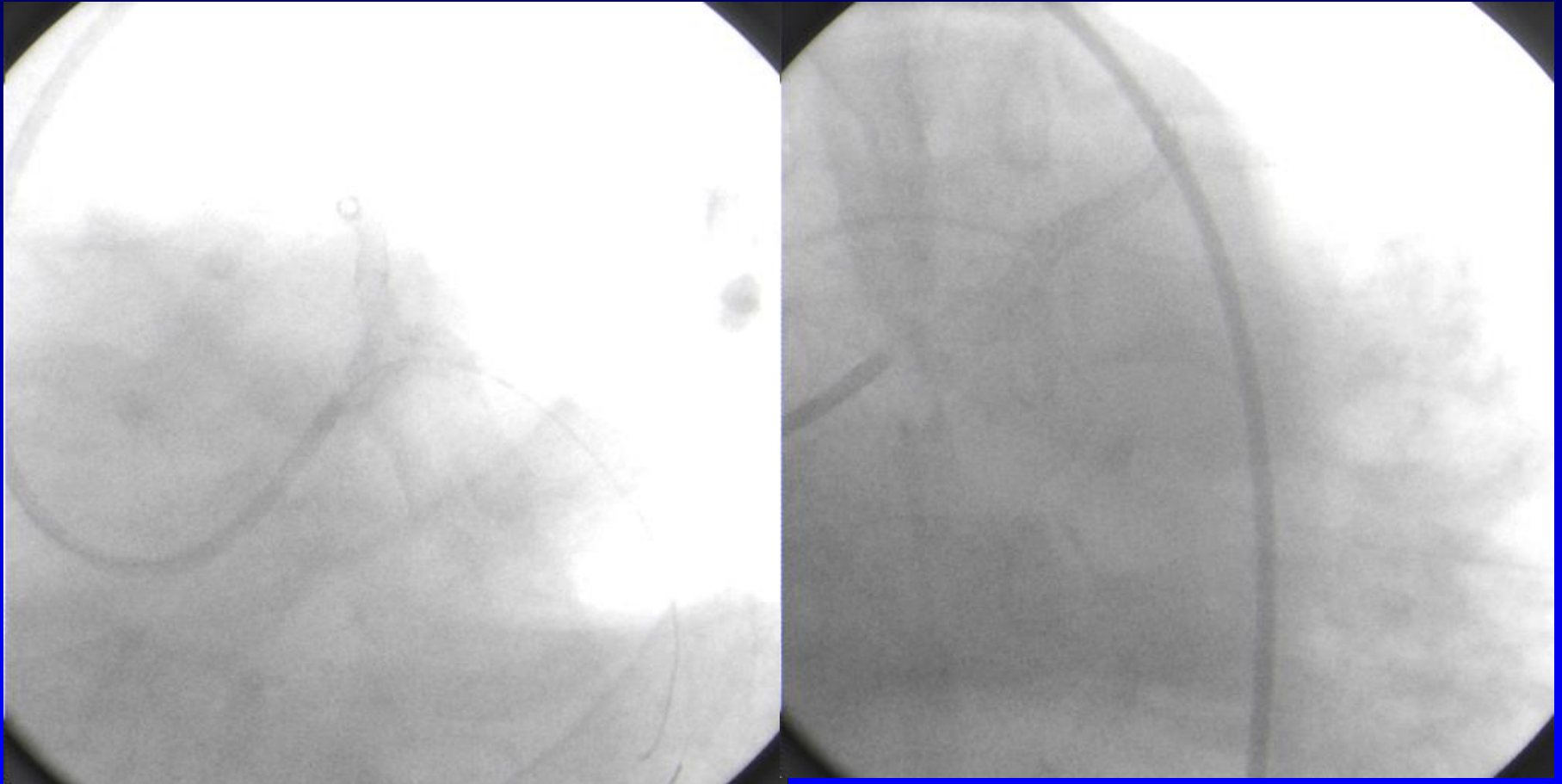


POBA su CX ostiale con DEB 3x10 mm, insufflato a 16 atm.





# Risultato finale



# DIMISSIONE E FOLLOW UP

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PZ asintomatico per angor e dispnea.

EF 47%. Acinesia apicale, assottigliamento dell'apice settale, ipocinesia media di parete anteriore e laterale.

PA:110/75 mmHg

ECG:RS a FC 63 BPM. QS V4-V6.

In programma tentativo di disostruzione di A.coronaria dx.

TO BE CONTINUED....

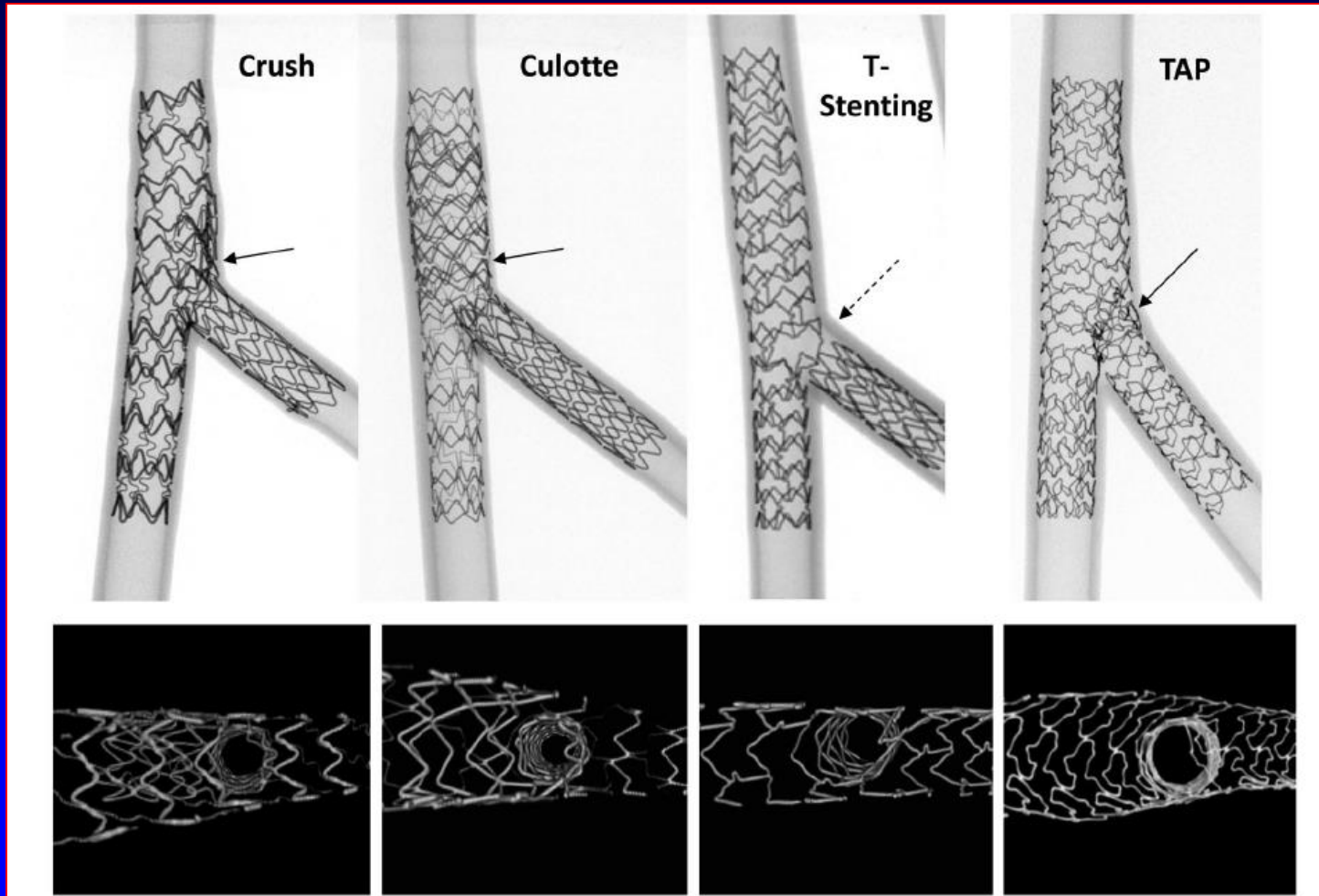




**Grazie per l'attenzione!!!**



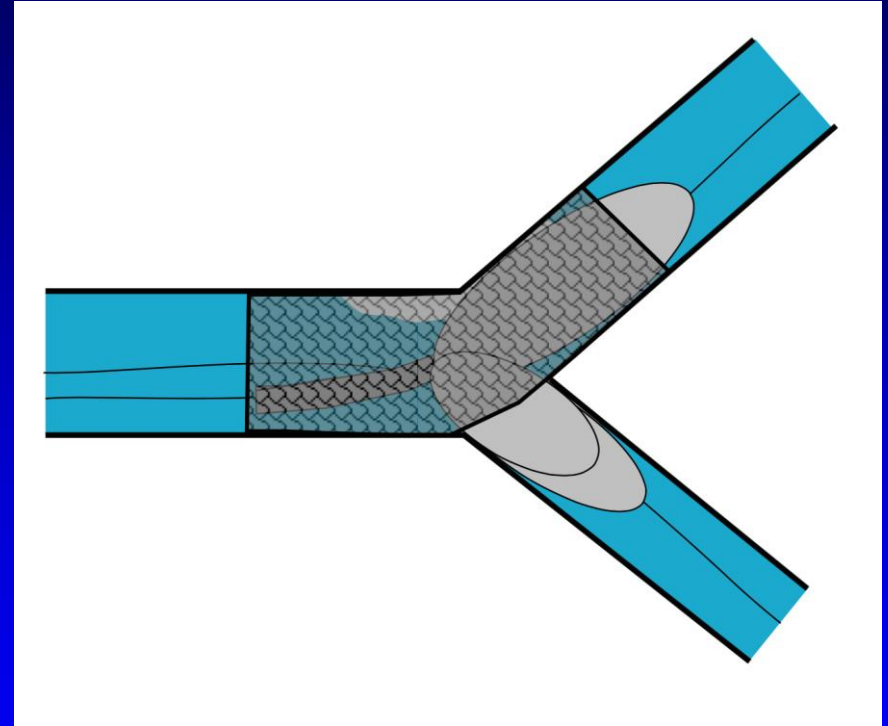
# Bifurcation: a complex stent treatment



# PROVISIONAL Stent Technique

*Provisional Stent Technique:  
The 'simplest' way to treat a  
bifurcation lesion*

- Wire both vessels (if needed)
- Pre-dilate as needed
- Stent main branch
- Rewire and balloon side branch
- (+/- kissing balloon inflation)



# PROVISIONAL Stent Technique

## Advantages:

- Simple
- Less Metal
- Easier to treat restenosis
- Less thrombosis?

## Disadvantages:

- Residual stenosis at side branch
- If side branch stent needed may be harder to insert through main branch stent

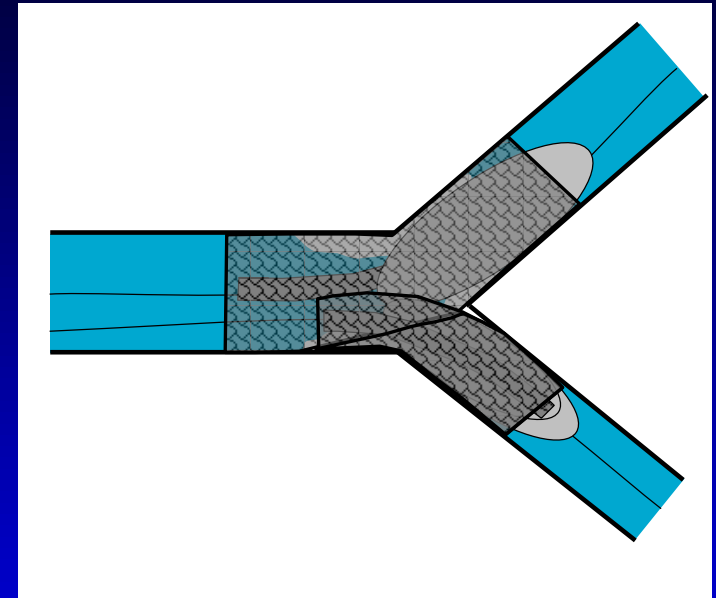
If a second stent is needed after provisional stenting is performed (ie: dissection or compromise of the sidebranch) the following techniques can be used:

- Culotte Technique
- Reverse Crush Technique
- TAP Technique



# CLASSICAL CRUSH Technique

- Wire both vessels
- Pre-dilate as needed
- Position stents
- Deploy side branch stent, remove balloon/wire
- Deploy main branch stent- 'crushes' side branch stent
- Rewire side branch and perform kissing balloon inflation



## Advantages:

- Assures ostium coverage
- Prevents loss of side branch
- Can be used if side branch and main branch are different sizes

## Disadvantages:

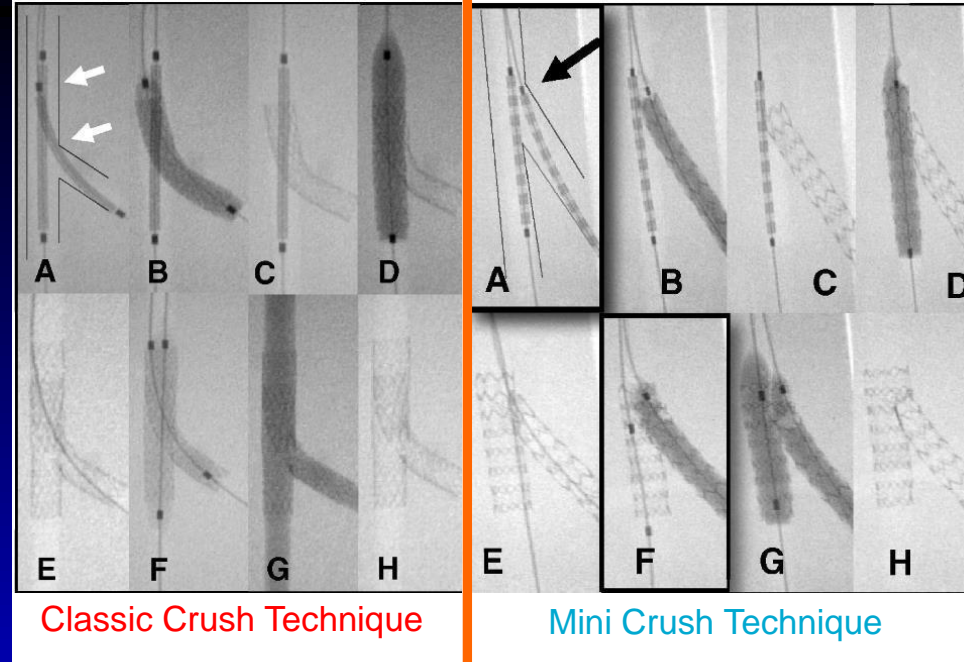
- Complex
- Time consuming
- Difficult to rewire
- Sometimes cannot perform final kiss
- Difficult to treat restenosis





## VARIANTI

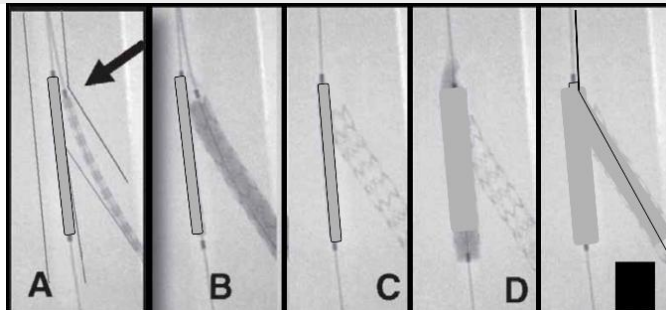
- Classic Crush
- Mini Crush
- Double Kissing Crush (DK Crush)
- Reverse Crush
- Step Crush



Classic Crush Technique

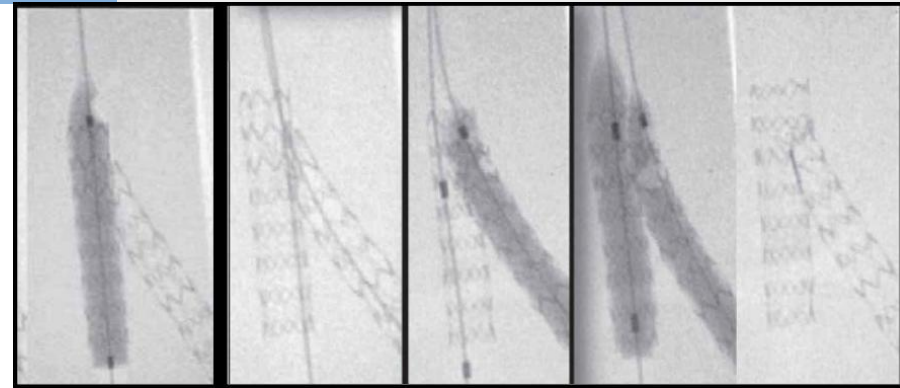
Mini Crush Technique

## DK Crush Technique



- Position sidebranch stent as if performing a Mini Crush, in conjunction with a balloon in the mainbranch
- Deploy sidebranch stent, withdraw sidebranch stent balloon slightly, then reinflate to high pressures to "flare" the proximal sidebranch stent
- Remove sidebranch balloon and wire
- Crush sidebranch stent with mainbranch balloon
- Rewire sidebranch and perform a kissing balloon inflation

## DK Crush Technique

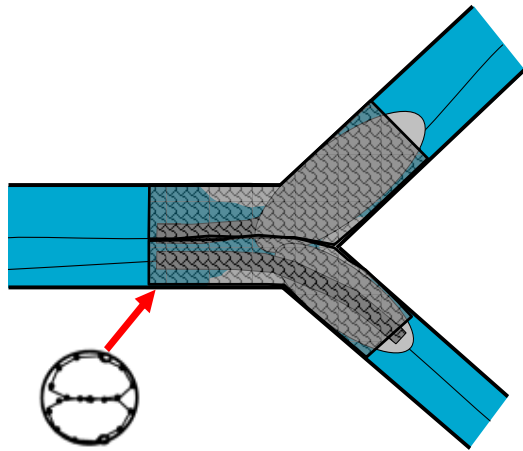


- Remove sidebranch wire and balloon
- Position stent in the mainbranch and deploy it
- Rewire sidebranch and perform final kissing balloon inflation





## The Simultaneous Kissing Stent (SKS) Technique

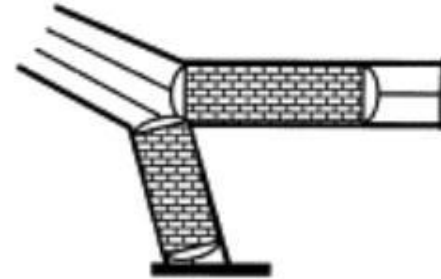


Cross Section

- Wire both vessels
- Pre-dilate as needed
- Position stents
- Deploy stents simultaneously
- Perform kissing balloon post-dilatation



## Simultaneous V Stenting Technique



- Identical to the SKS technique, but without the creation of a new carina

### Advantages:

- Simple
- Maintain wire access to both branches at all times
- Minimal ischemic time similar size

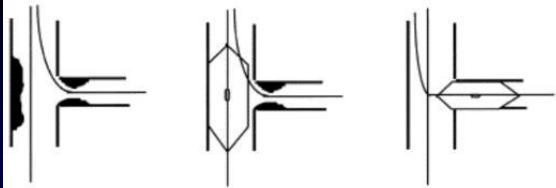
### Disadvantages:

- Can be difficult to rewire later
- Longer carinas can cause trouble later
- Requires larger vessels of similar size
- More restenosis

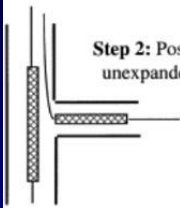




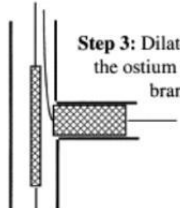
Step 1: Wire and dilate both branches



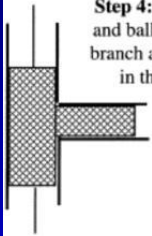
Step 2: Position both unexpanded stents.



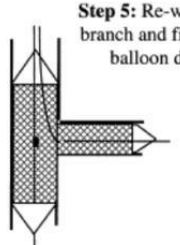
Step 3: Dilate the stent at the ostium of the side branch.



Step 4: Remove the wire and balloon from the side branch and dilate the stent in the main branch



Step 5: Re-wire the side branch and final kissing balloon dilation.



# Traditional T Stent Technique



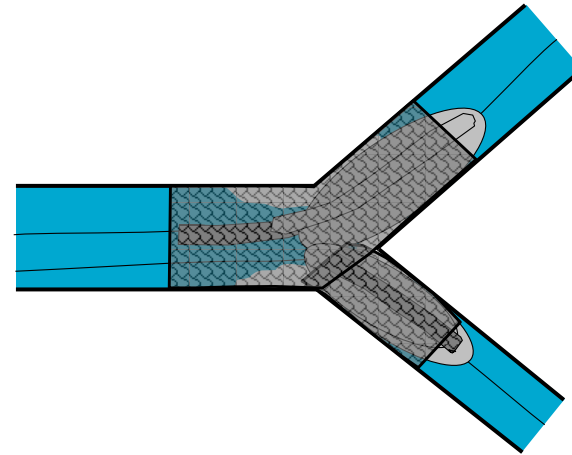
## PROBLEM:

Almost NEVER is there a perfect 90 degree angle between mainbranch and sidebranch!

Use of the traditional T stent technique is associated with high risk of missing the sidebranch ostium

# The TAP Technique

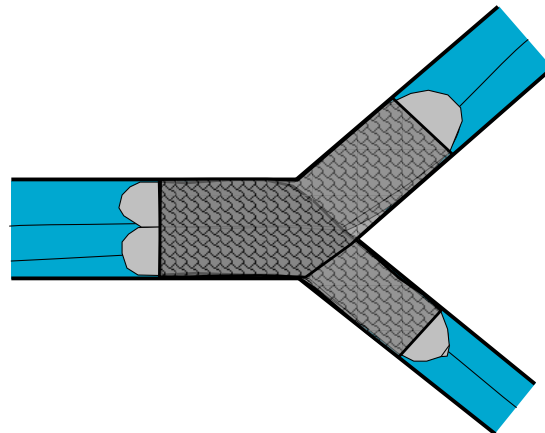
## T stent And Protrusion



- Wire both vessels
- Pre-dilate as needed
- Position and deploy main branch stent
- Rewire side branch and balloon dilate
- Position side branch stent so proximal edge protrudes slightly into main branch, 'backstop' balloon in main branch
- Deploy side branch stent first, then inflate main branch balloon to kiss



# The Culotte Technique



- Wire both vessels
- Pre-dilate as needed
- Position and deploy stent in most angulated branch
- Remove first wire, wire second branch and balloon dilate
- Position second branch stent so proximal portion equal with previous stent edge and deploy
- Rewire initially stented branch and perform kissing post-dilatation

