Types of Coronary Perforations and How to Manage Pericardiocentesis

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Conflict statement

Speaker's name: Naoto Inoue

- **I have the following potential conflicts of interest to report:**
  - Consulting-Kaneka, Tokai medical
  - ❒ Employment in industry
  - ❒ Stockholder of a healthcare company
  - ❒ Owner of a healthcare company
  - ❒ Other(s)

❒ **I do not have any potential conflict of interest**

Coronary perforation

- ✓ *Guide wire induced*
- ✓ *Guiding catheter induced*
- ✓ *Balloon, Rotablator, DCA induced*

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Coronary perforation

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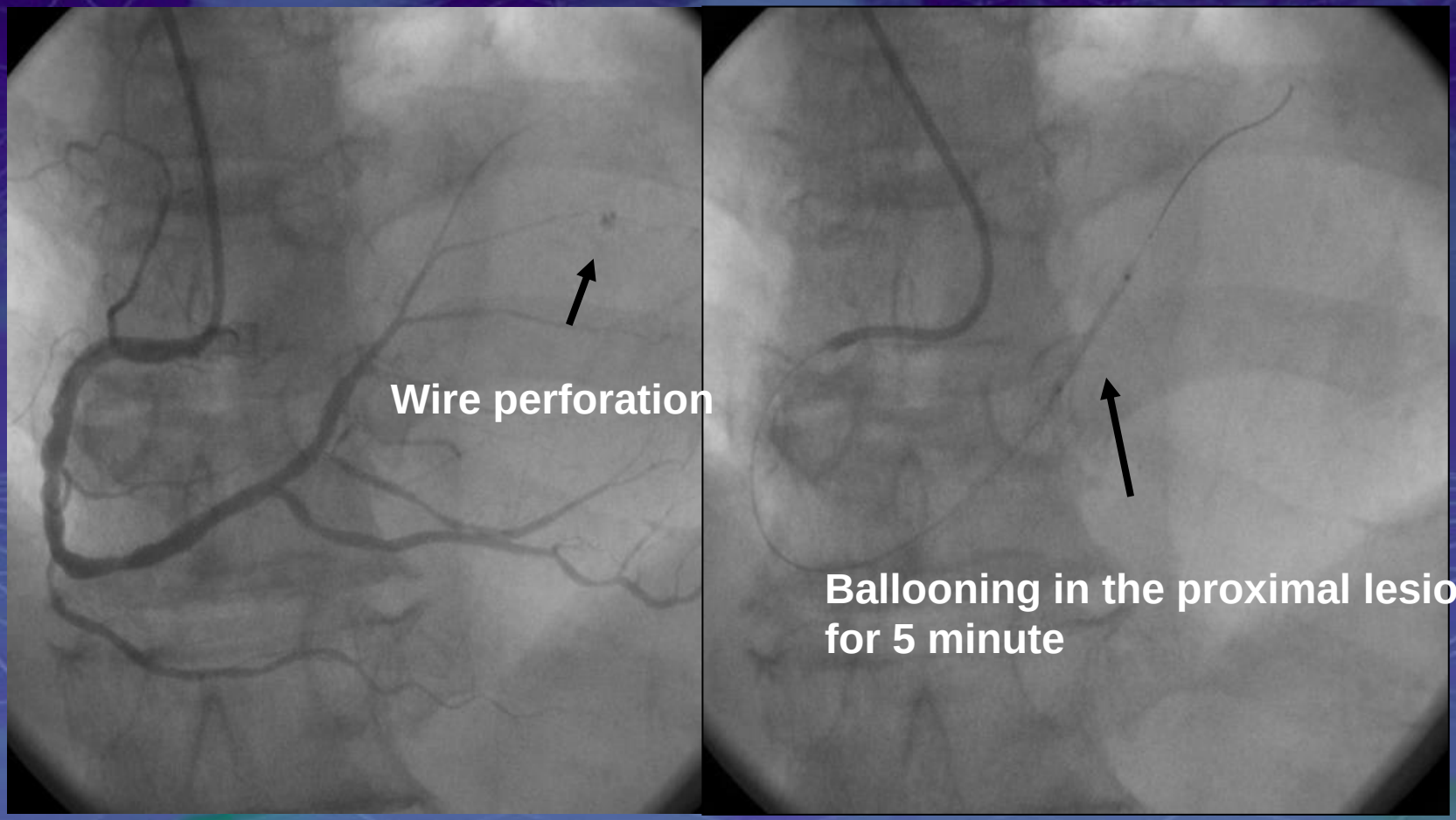
Wire perforation Ⅰ



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Wire perforation Ⅰ

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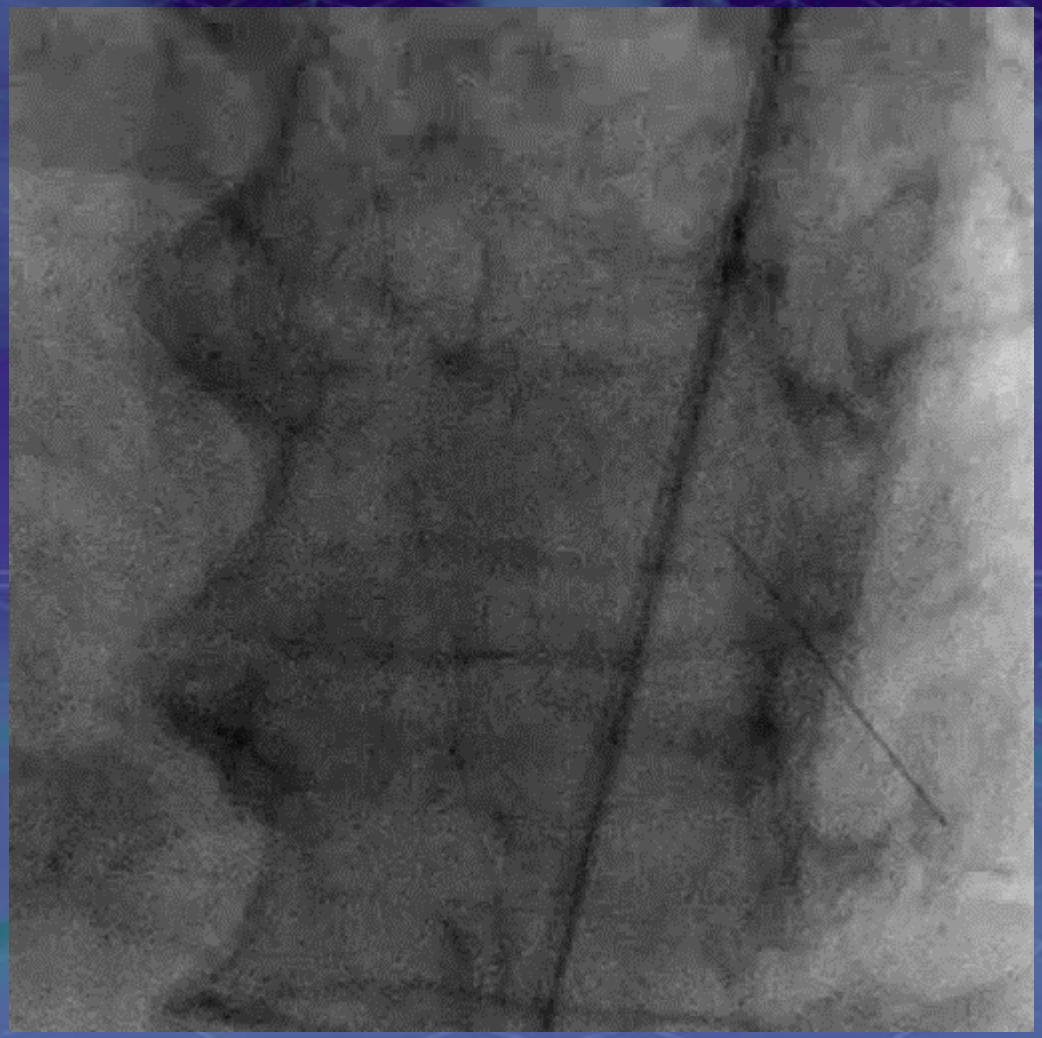
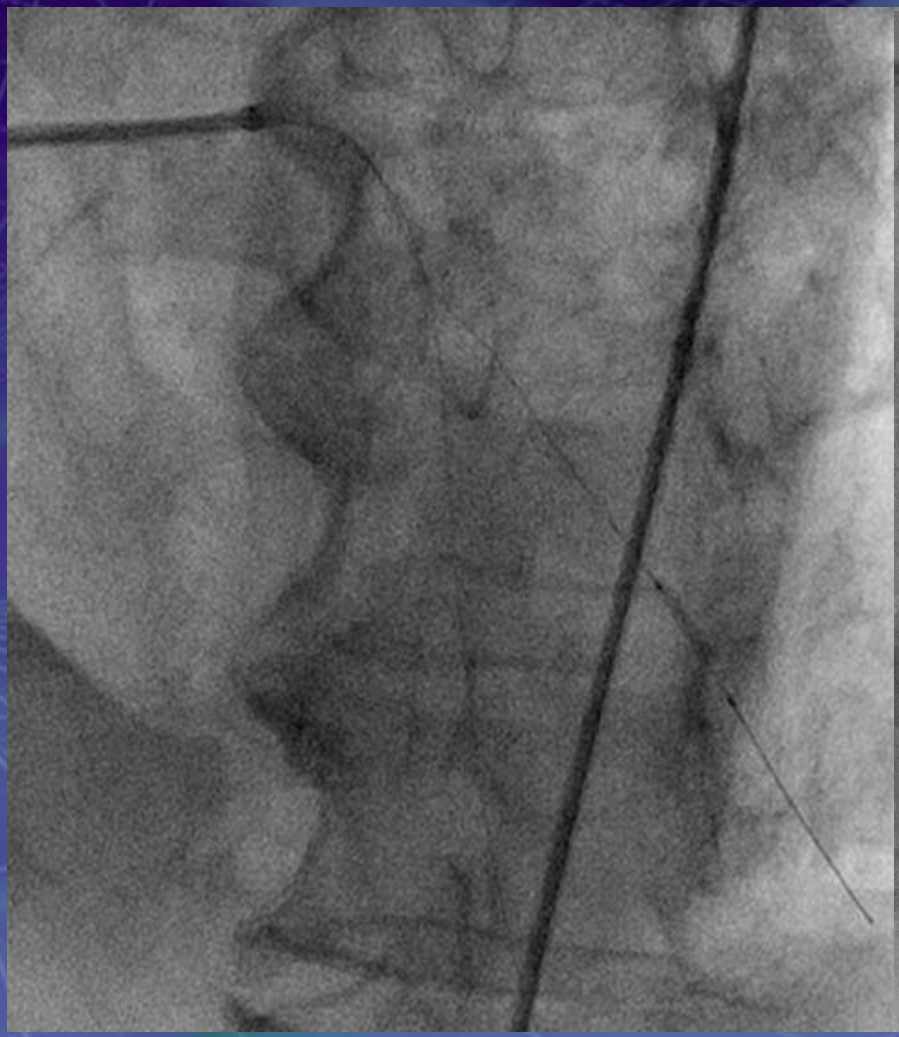
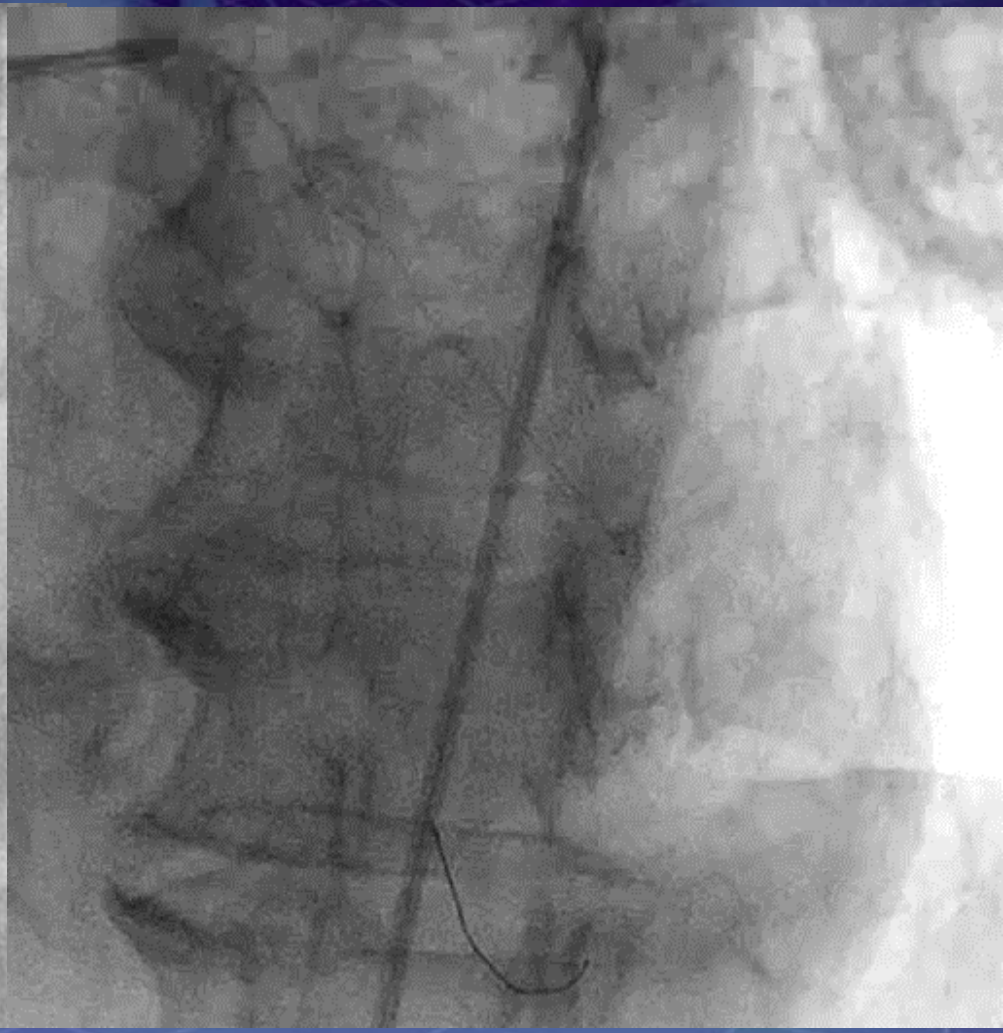
Wire perforation II





Balloon inflation 5 min



No hemostasis

Next step?

Embolization

- Coil
- Tissue
- Sponge Gel

Negative pressure

Neutralize heparin

Catheterization and Cardiovascular Interventions 66:369–374 (2005)

Guidewire-Induced Coronary Artery Perforation Treated With Transcatheter Delivery of Subcutaneous Tissue

Hirotaka Oda,* MD, Masato Oda, MD, Yashiro Makiyama, MD, Takeshi Kashimura, MD, Kazuyoshi Takahashi, MD, Tsutomu Miida, MD, and Norio Higuma, MD

In three cases of small coronary artery perforation by guidewires during percutaneous coronary intervention, coronary leakage continued despite prolonged balloon inflation and reversal of heparin. Subcutaneous tissue was selectively delivered to perforated vessels by means of microcatheters in a successful attempt to stop leakage. This method appears to be extremely effective for treating guidewire-induced perforations of distal coronary arteries.

Key words: coronary bleeding; embolization; tissue factor; thrombus; fat; fibroblast

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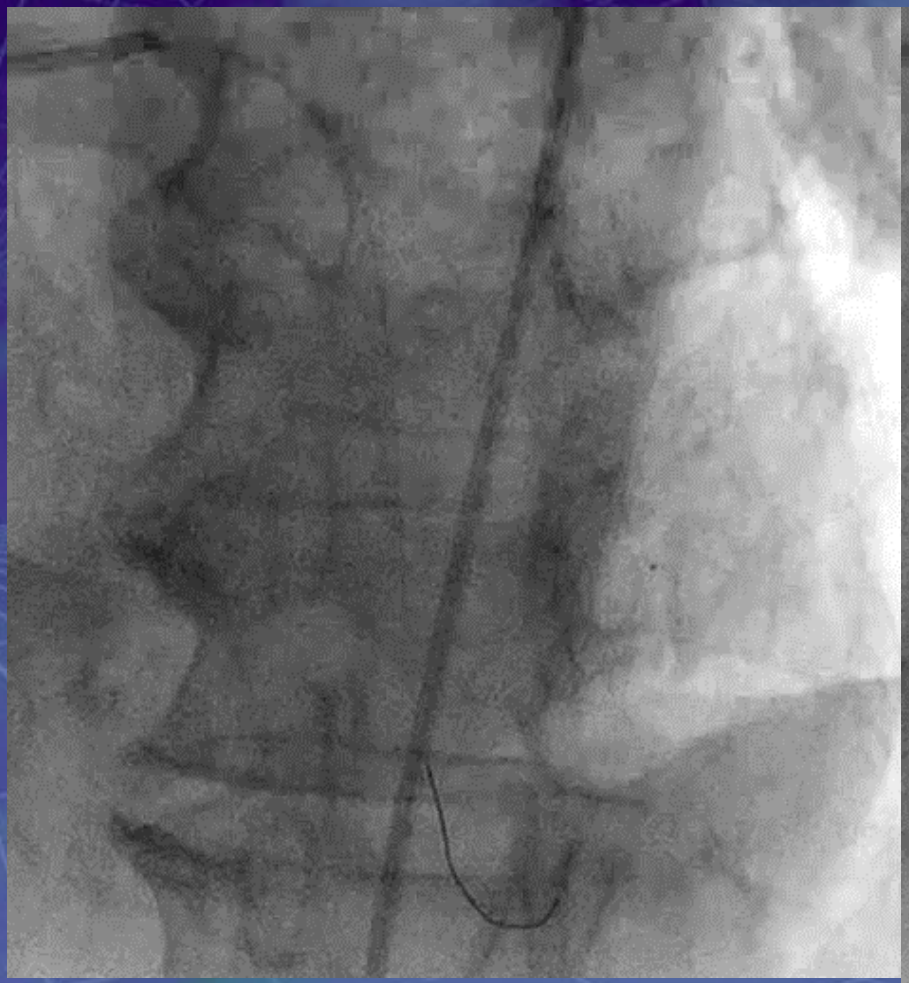
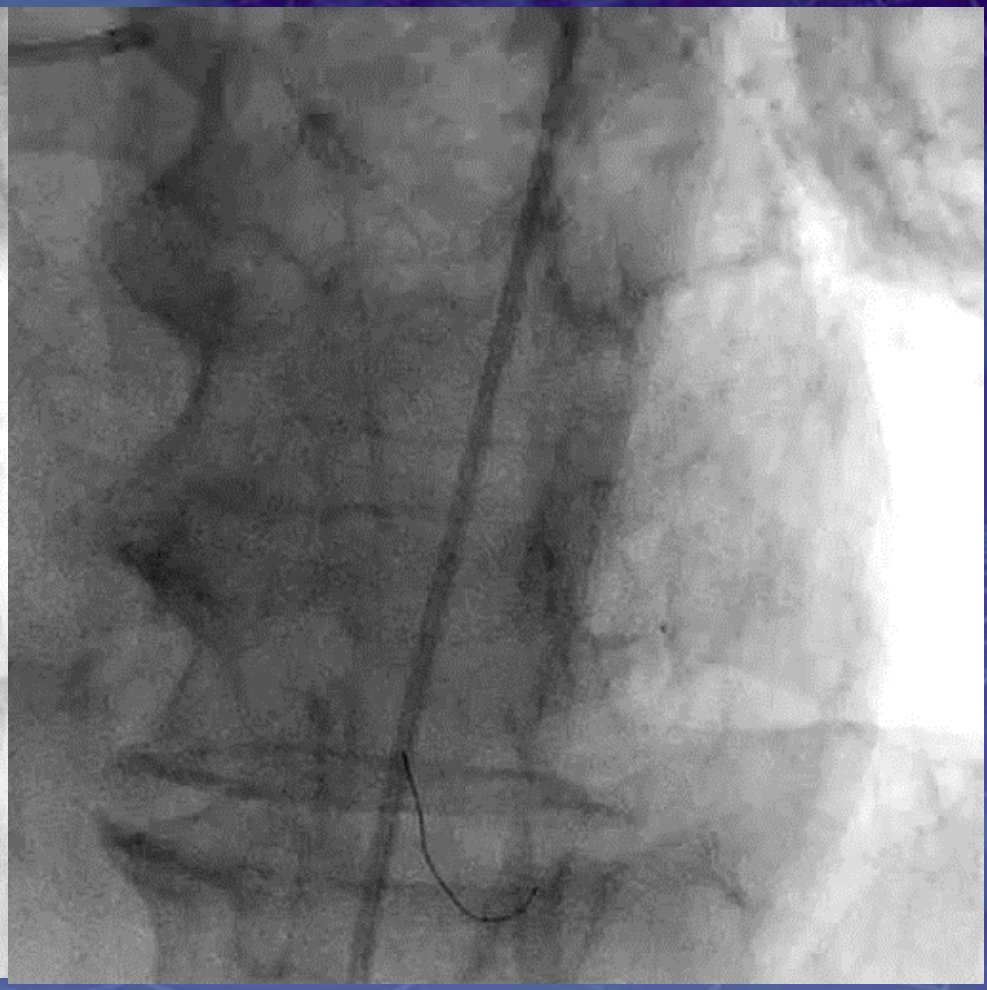
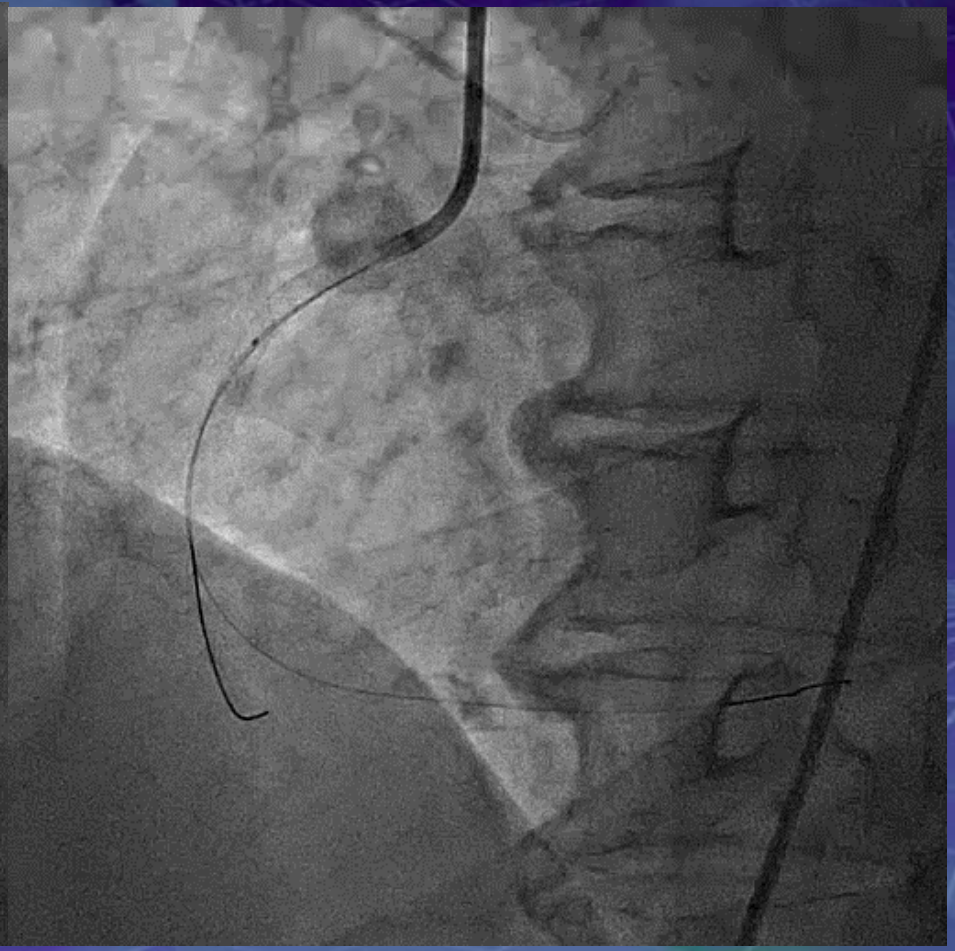
Sponge Gel

Sponge Gel



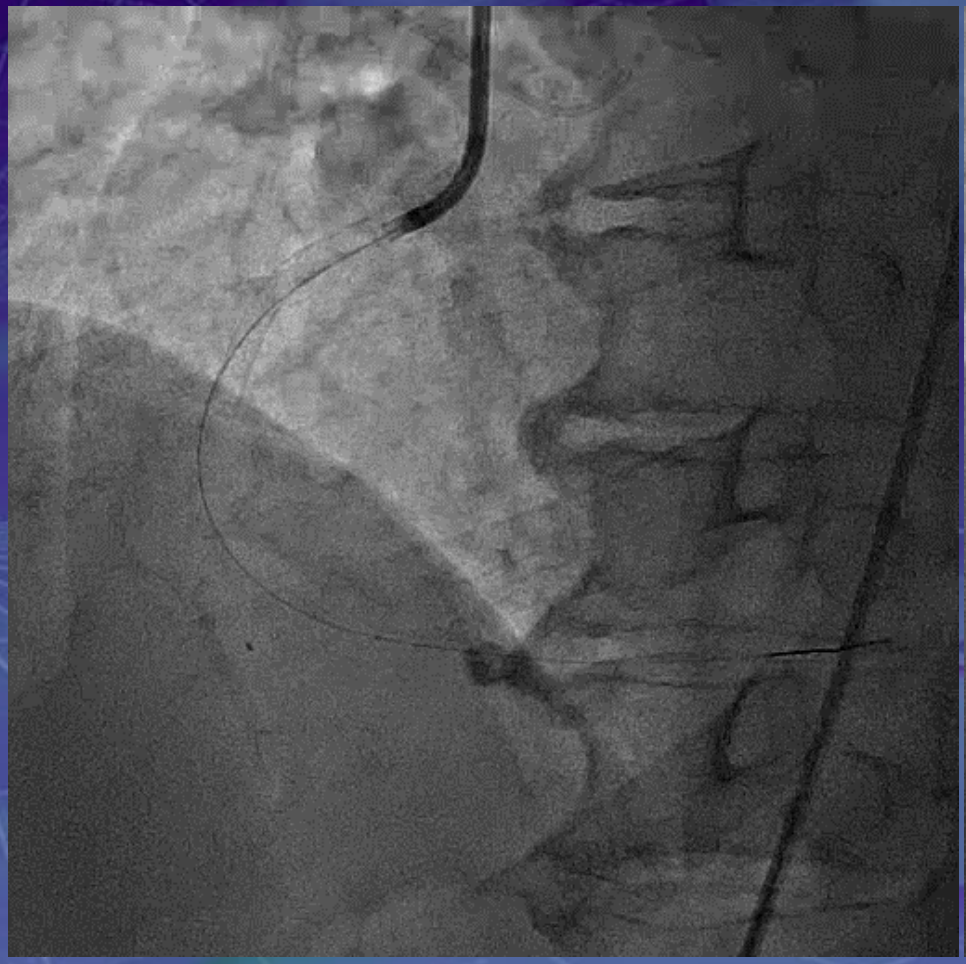


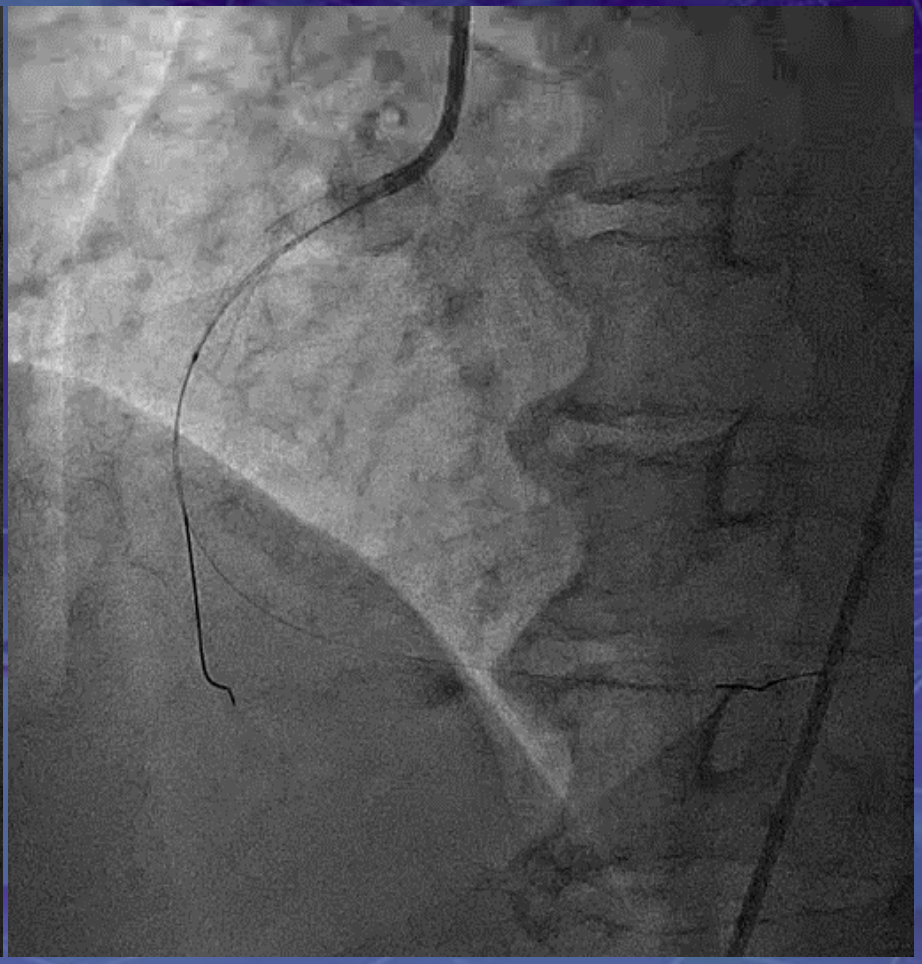
Negative pressure by wedged MC



Vessel shrinks by the negative pressure using balloon indefrator (8-10atm)

Negative pressure by wedged MC





Negative pressure with microcatheter

Minor perforation is not an endpoint in CTO procedure

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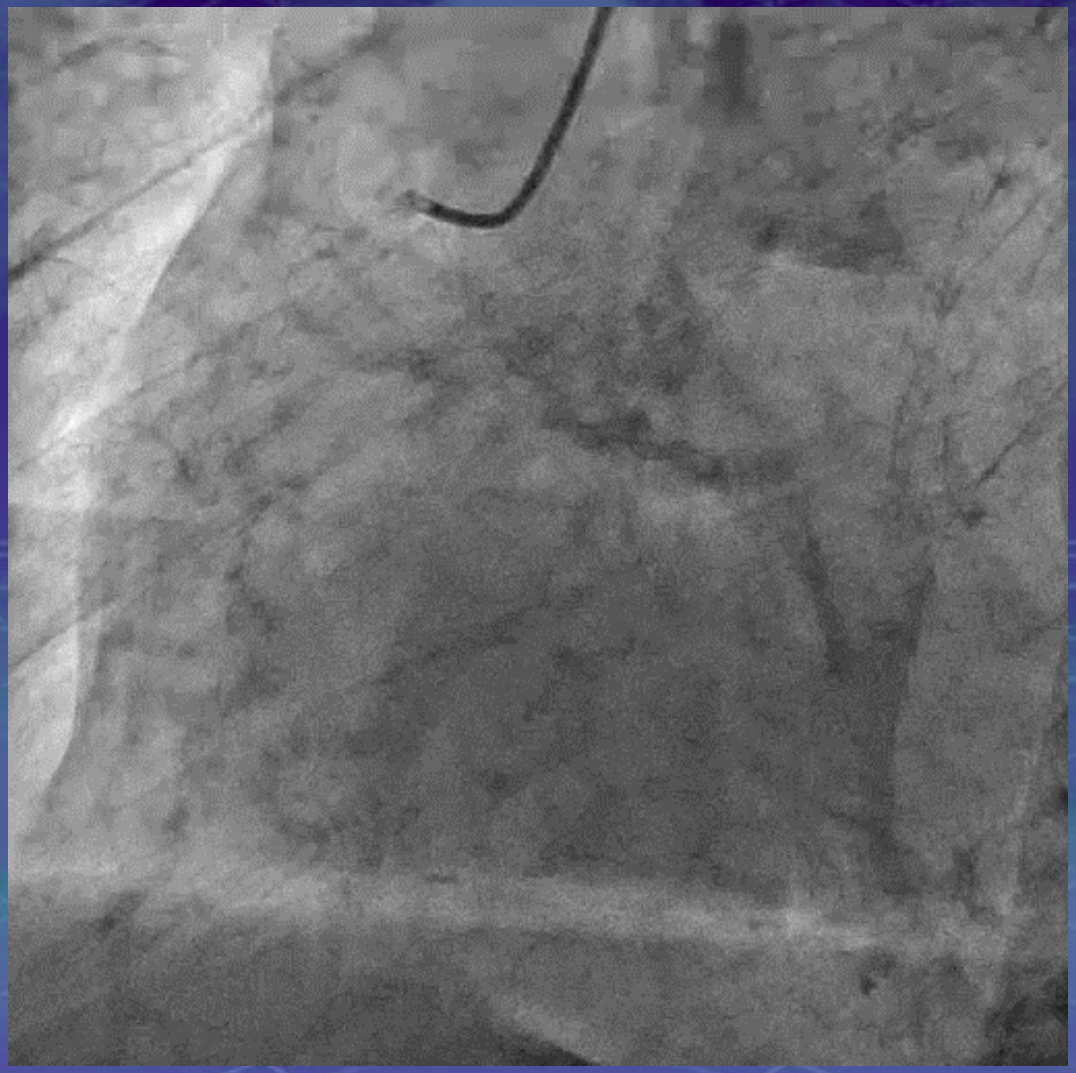
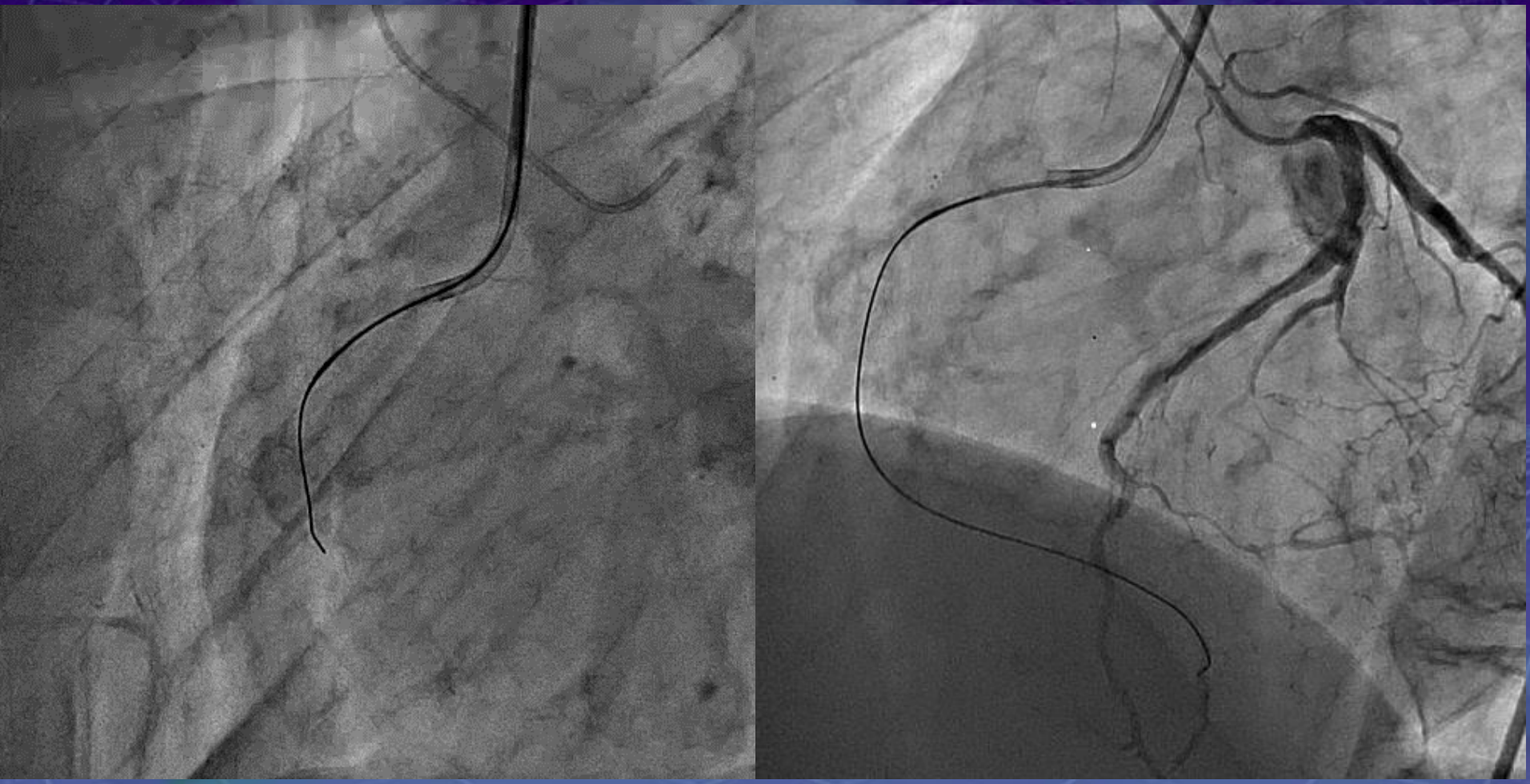
Bridge collateral



Bridge collateral (perforation)



Ultimate Bros 3g

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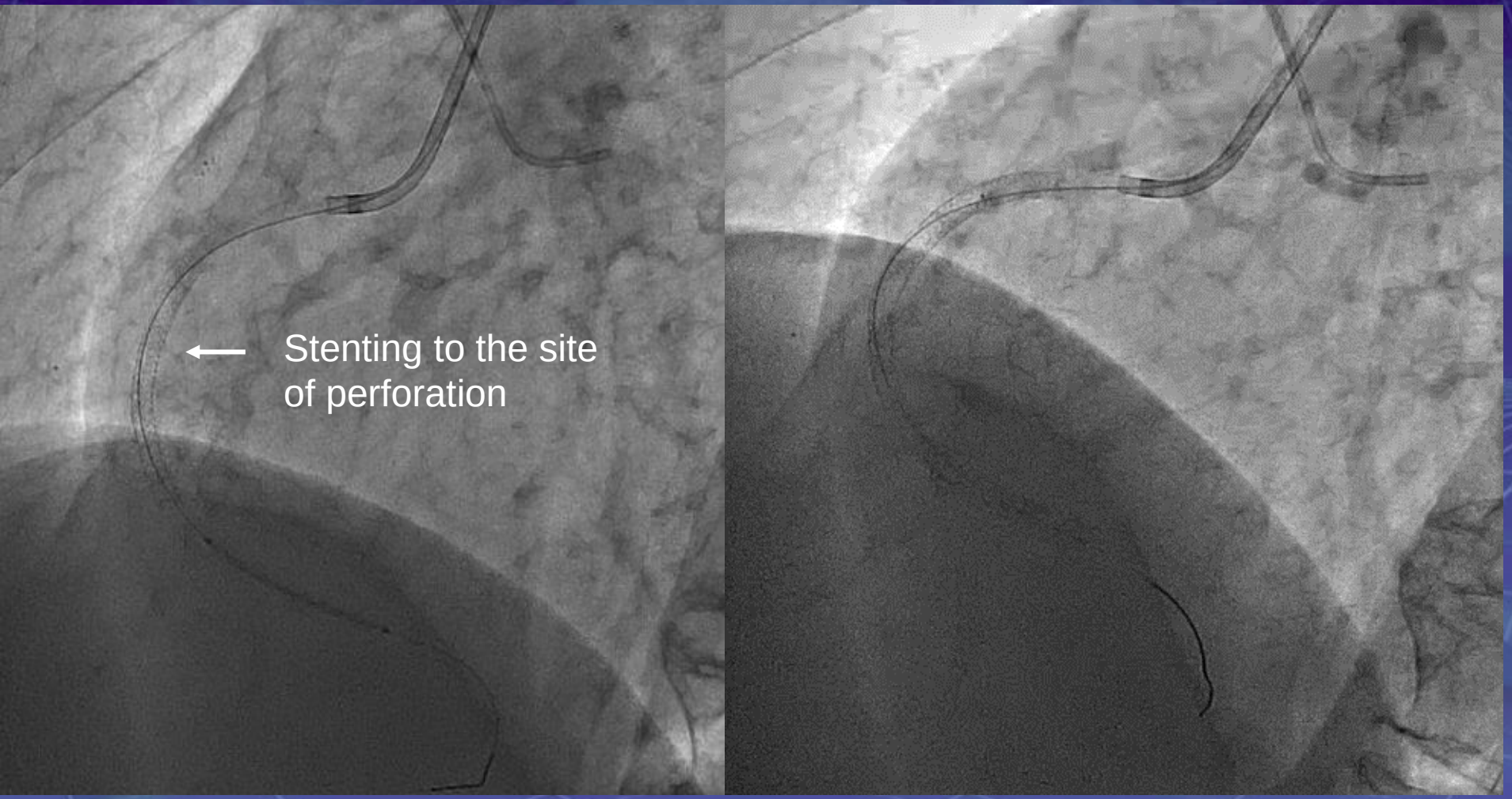
Bridge collateral (perforation)



Coronary perforation

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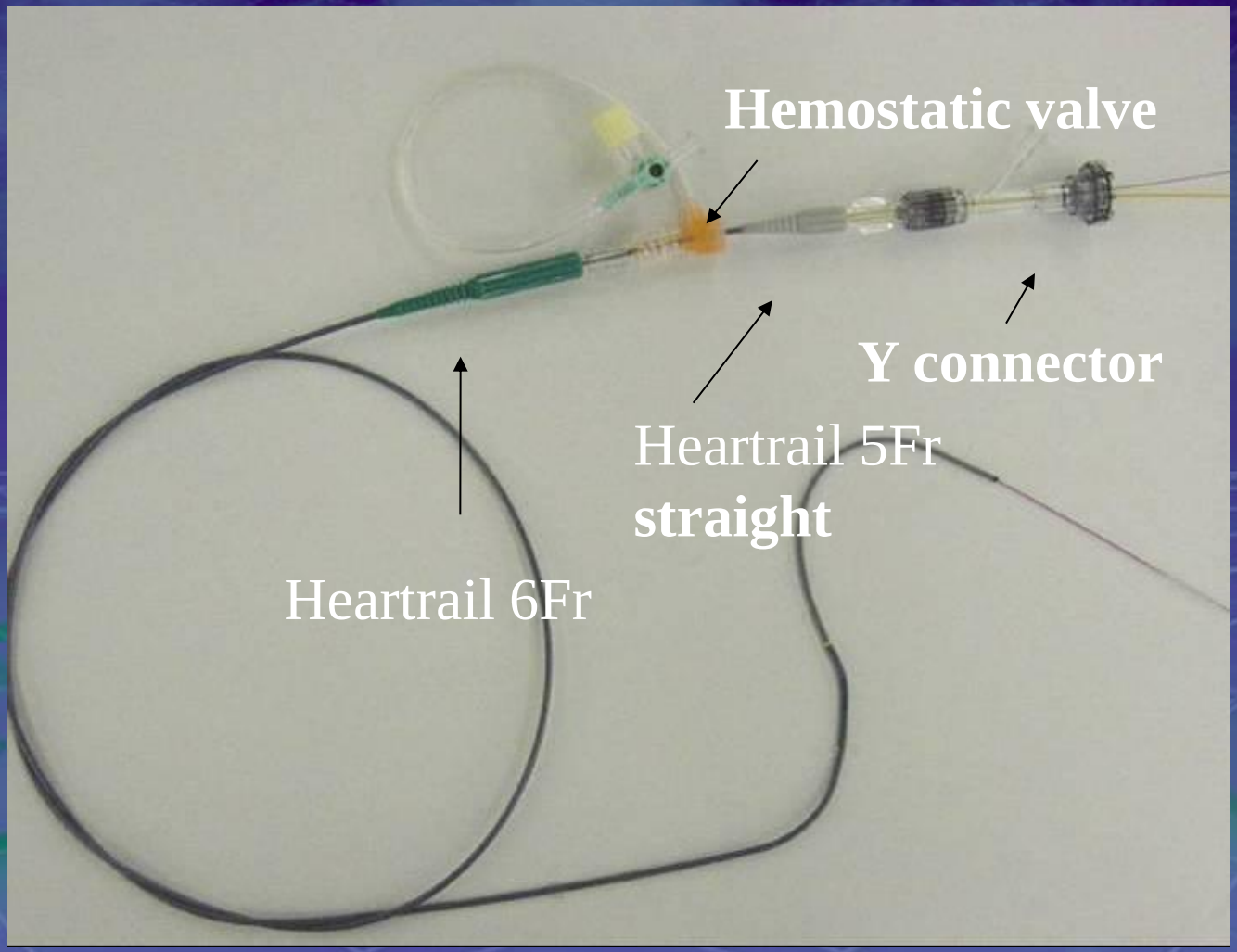
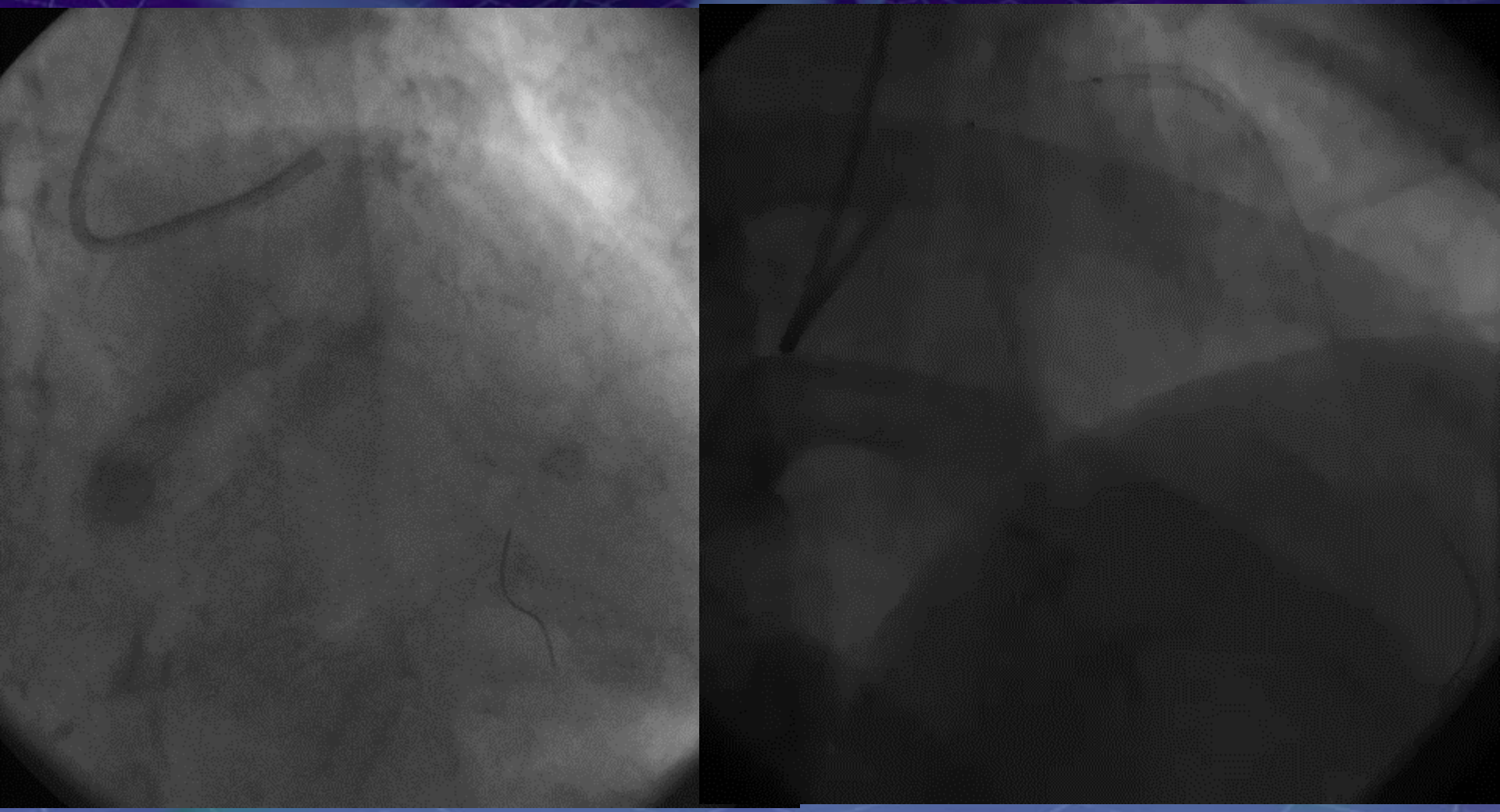
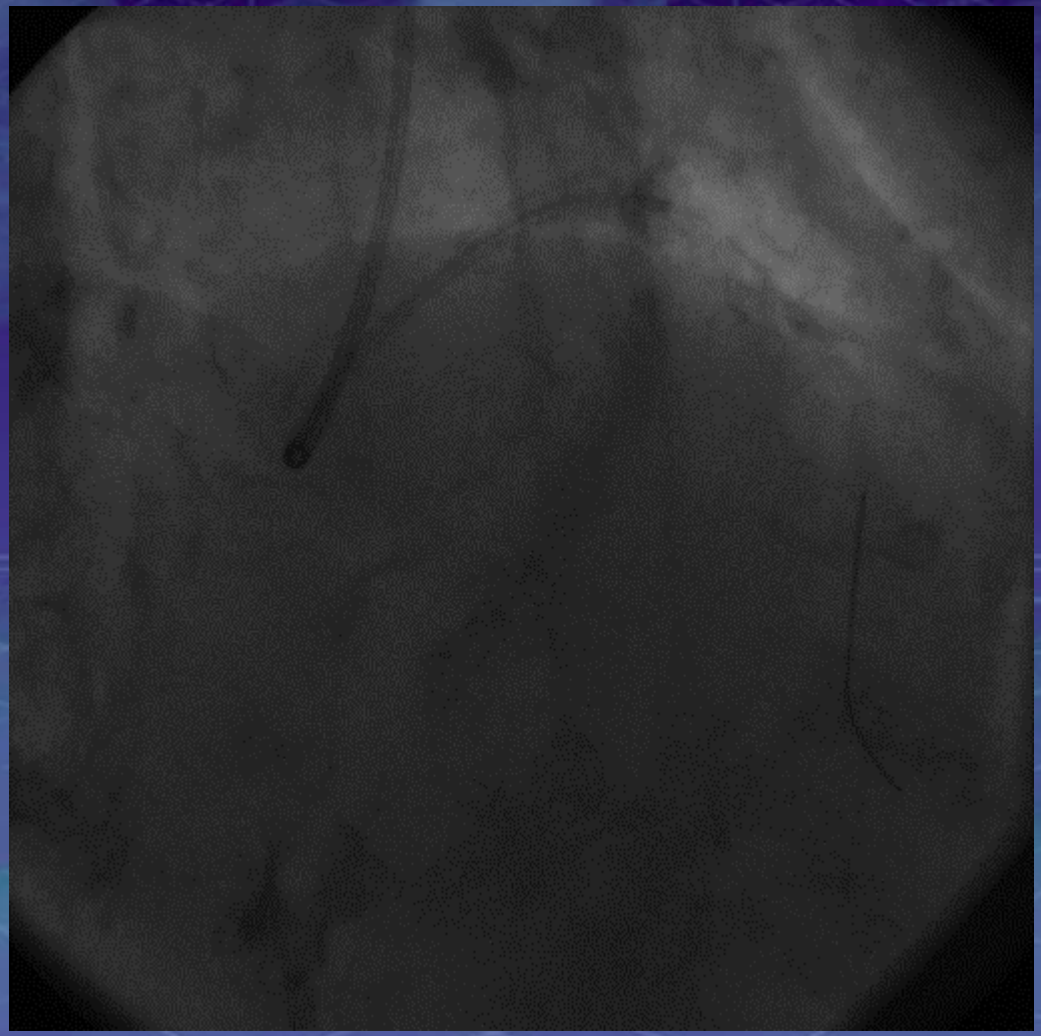
Coronary perforation by 5F in 6F guiding catheter



Coronary perforation by 5F in 6F guiding catheter



Coronary perforation by 5F in 6F guiding catheter



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Coronary perforation

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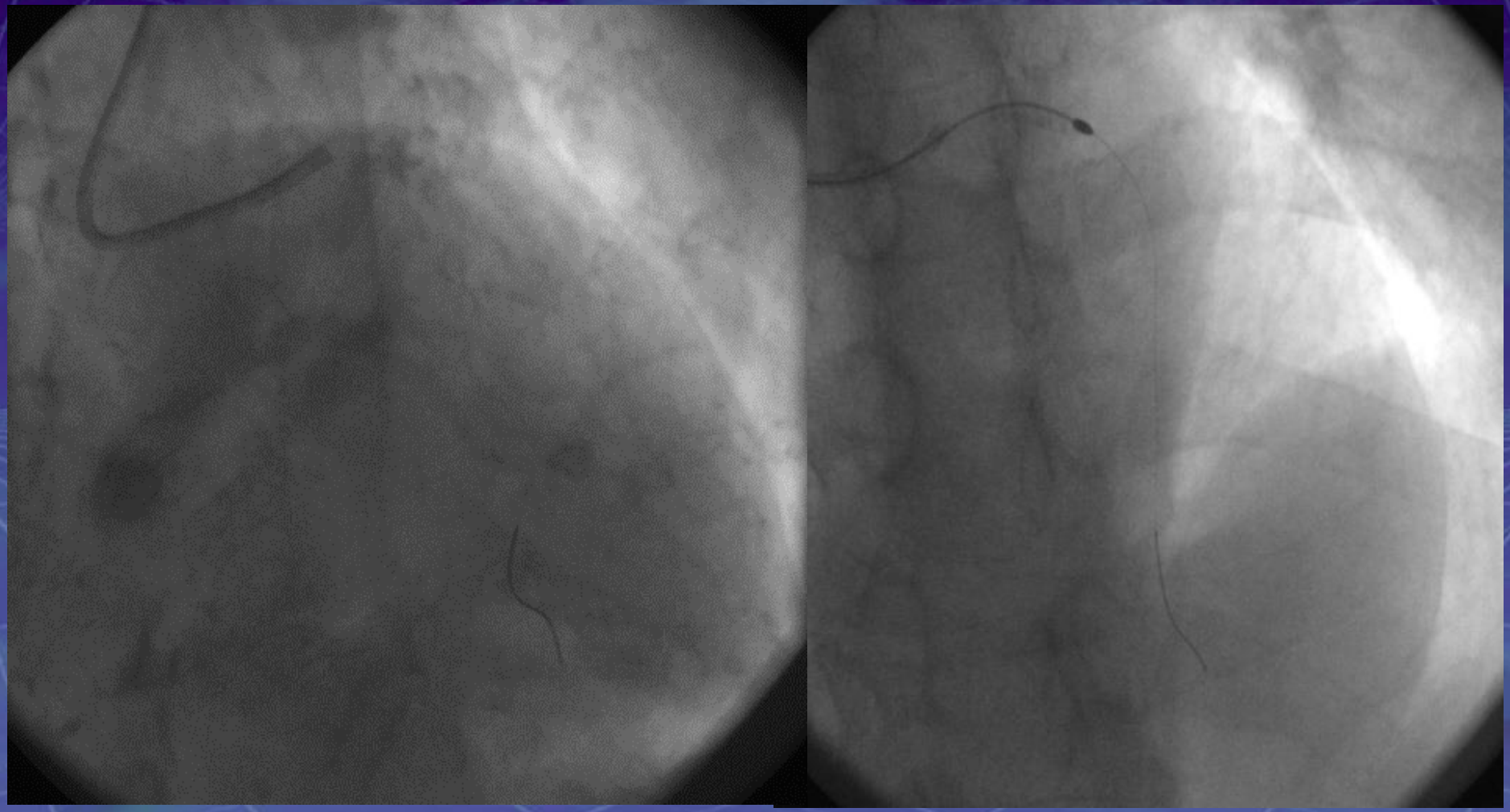
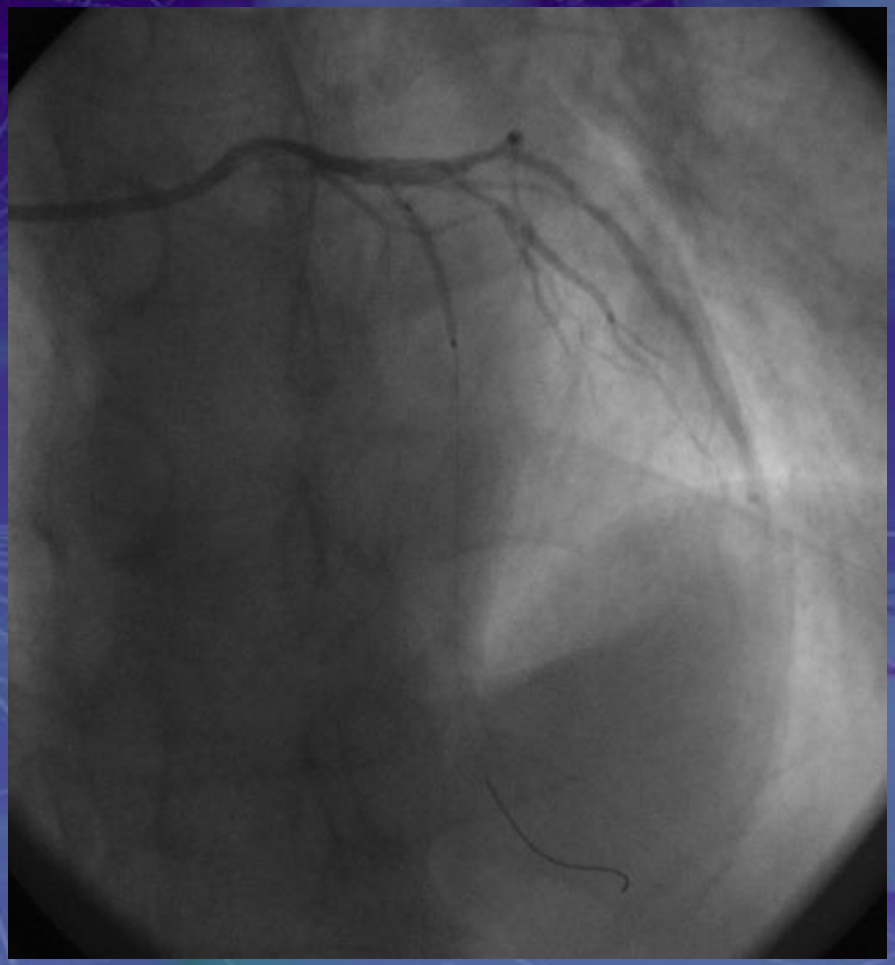
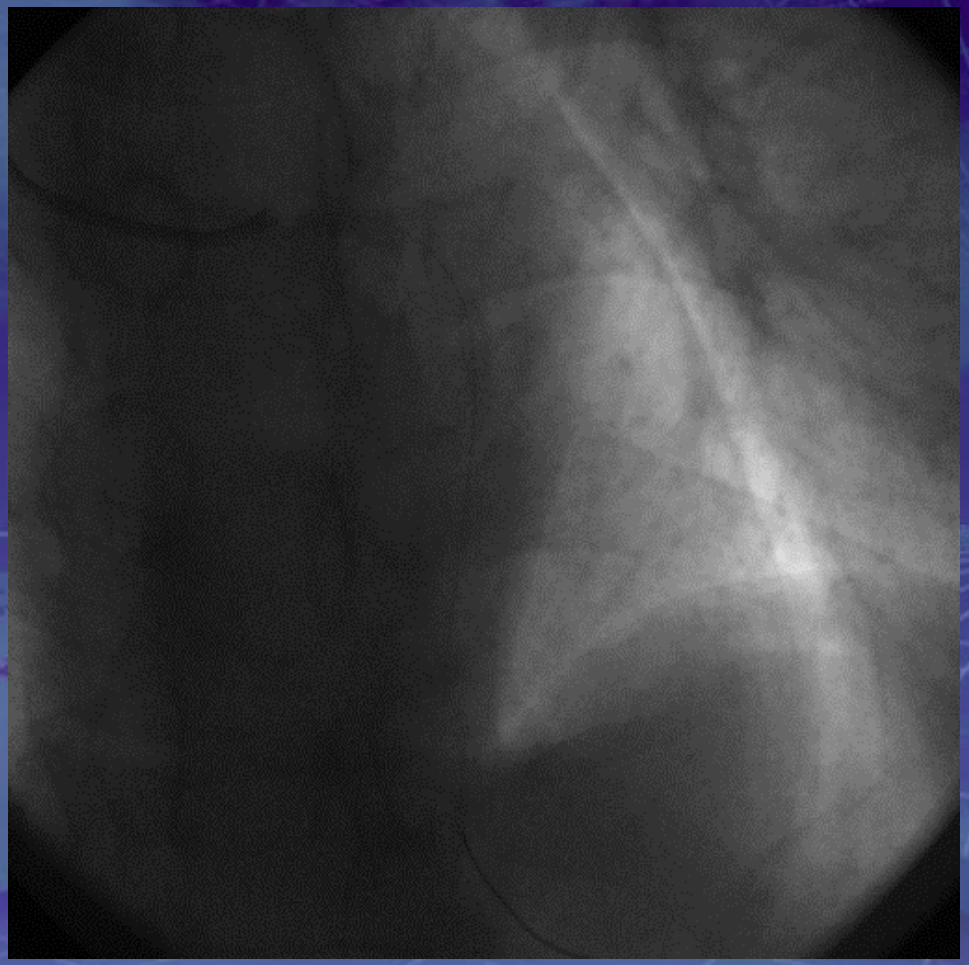
Rotablator induced perforation

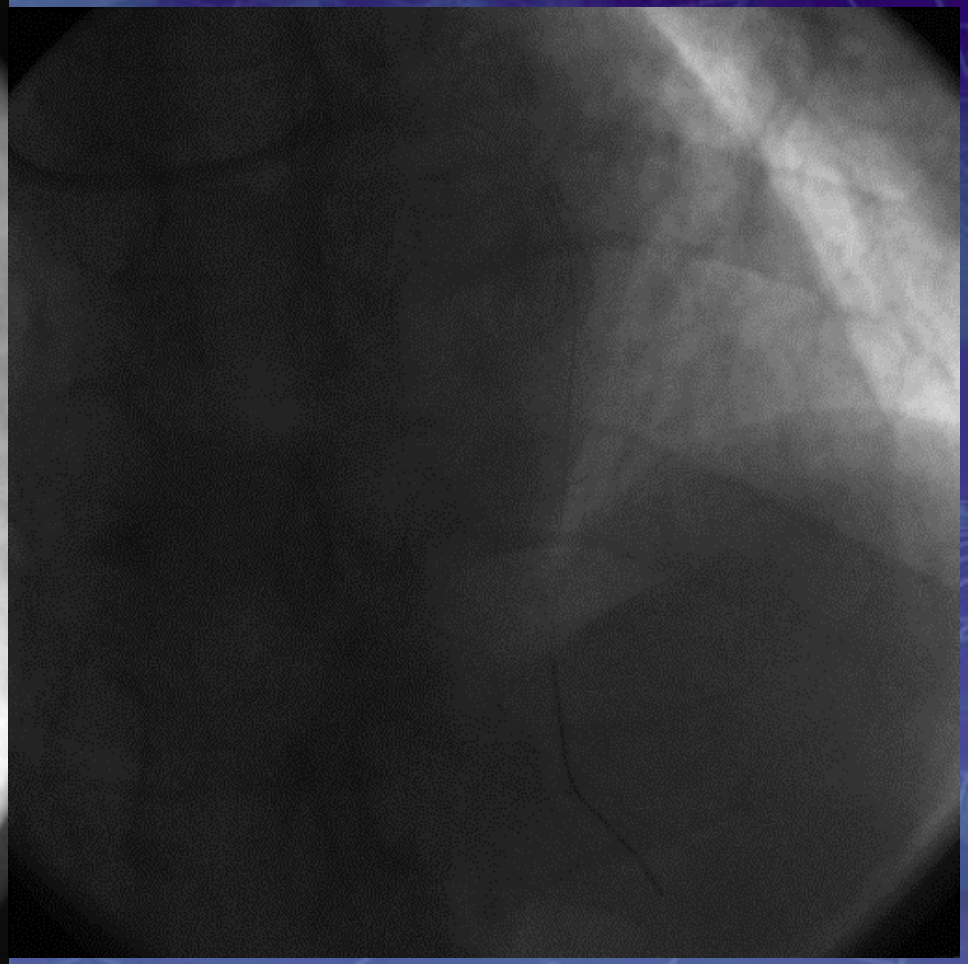


Rotablator induced perforation





Rotablator induced perforation



Balloon inflation 5 min

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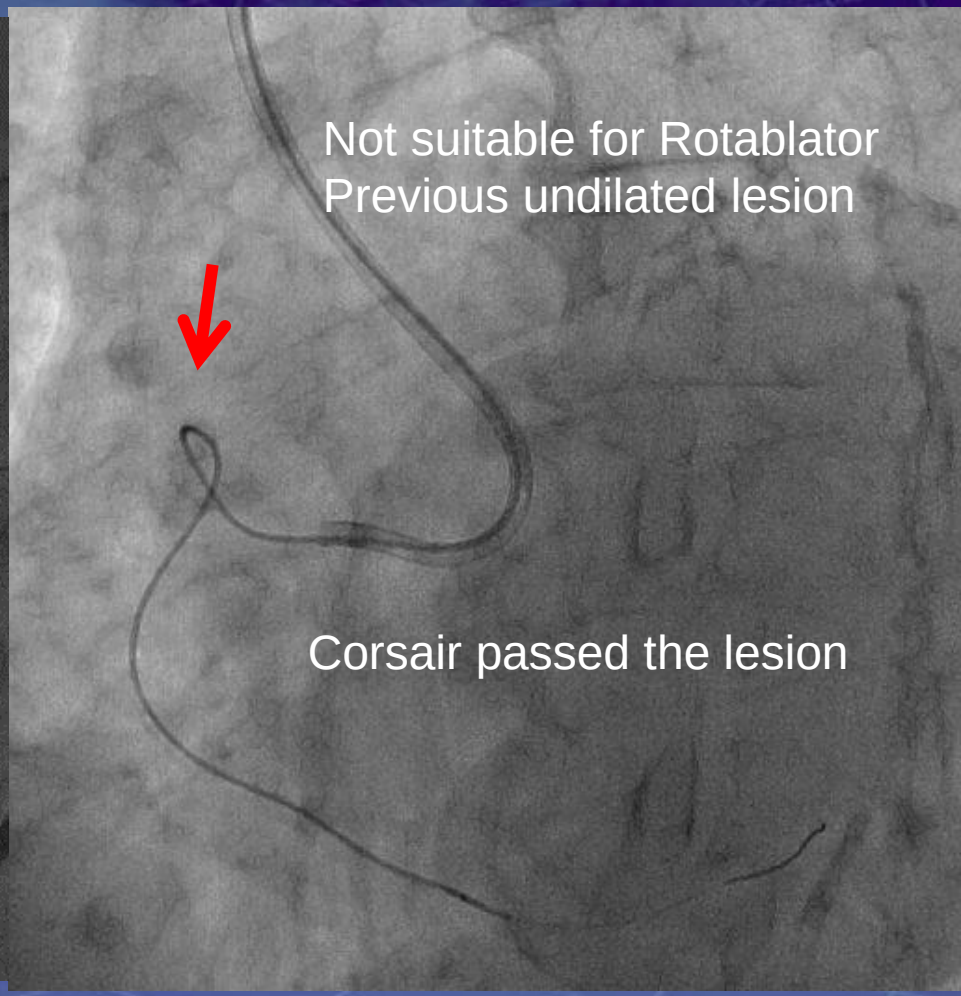
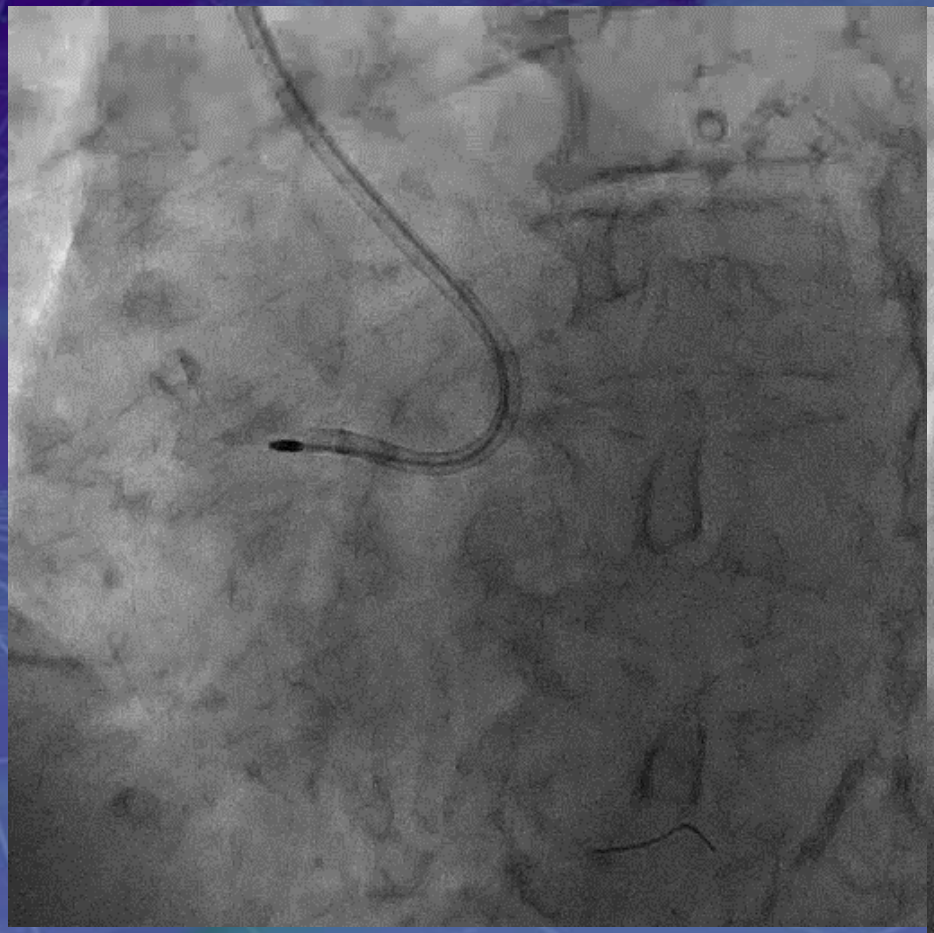
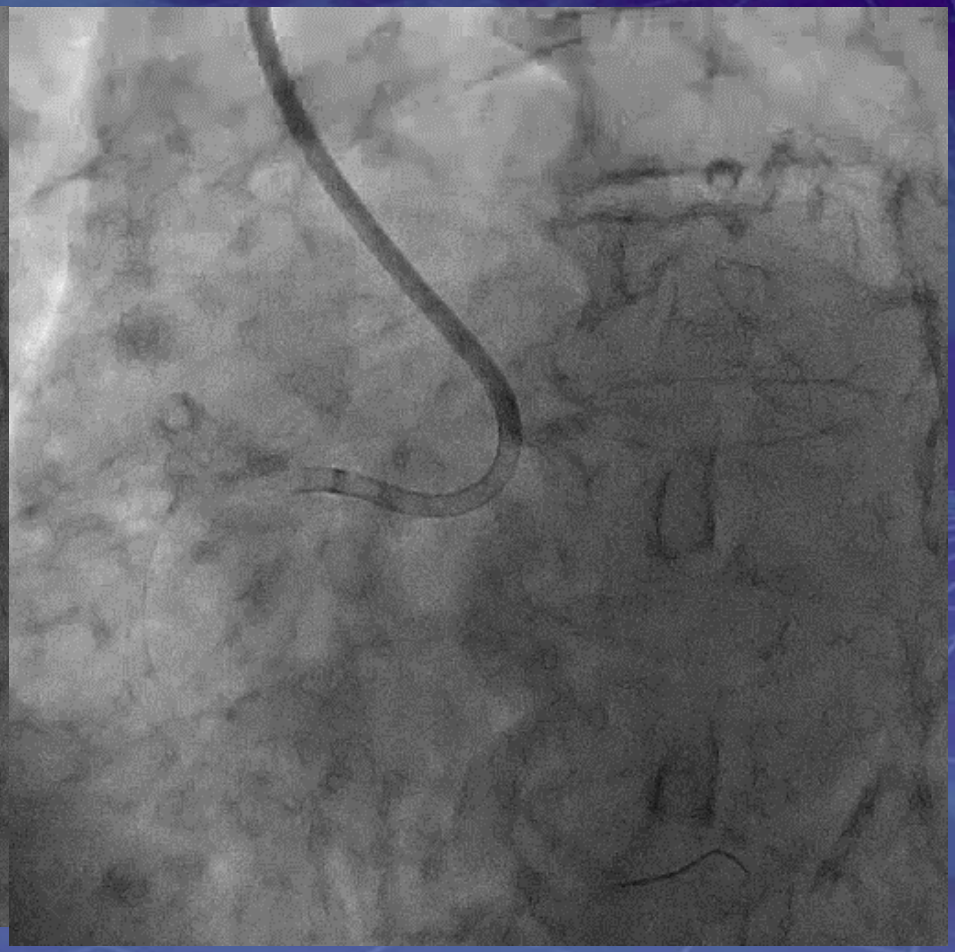
PCI for RCA-CTO



PCI for RCA-CTO





Changed to Rota Floppy wire
1.25 mm burr 200,000 rpm

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Next step?

Ballooning in the RCAos

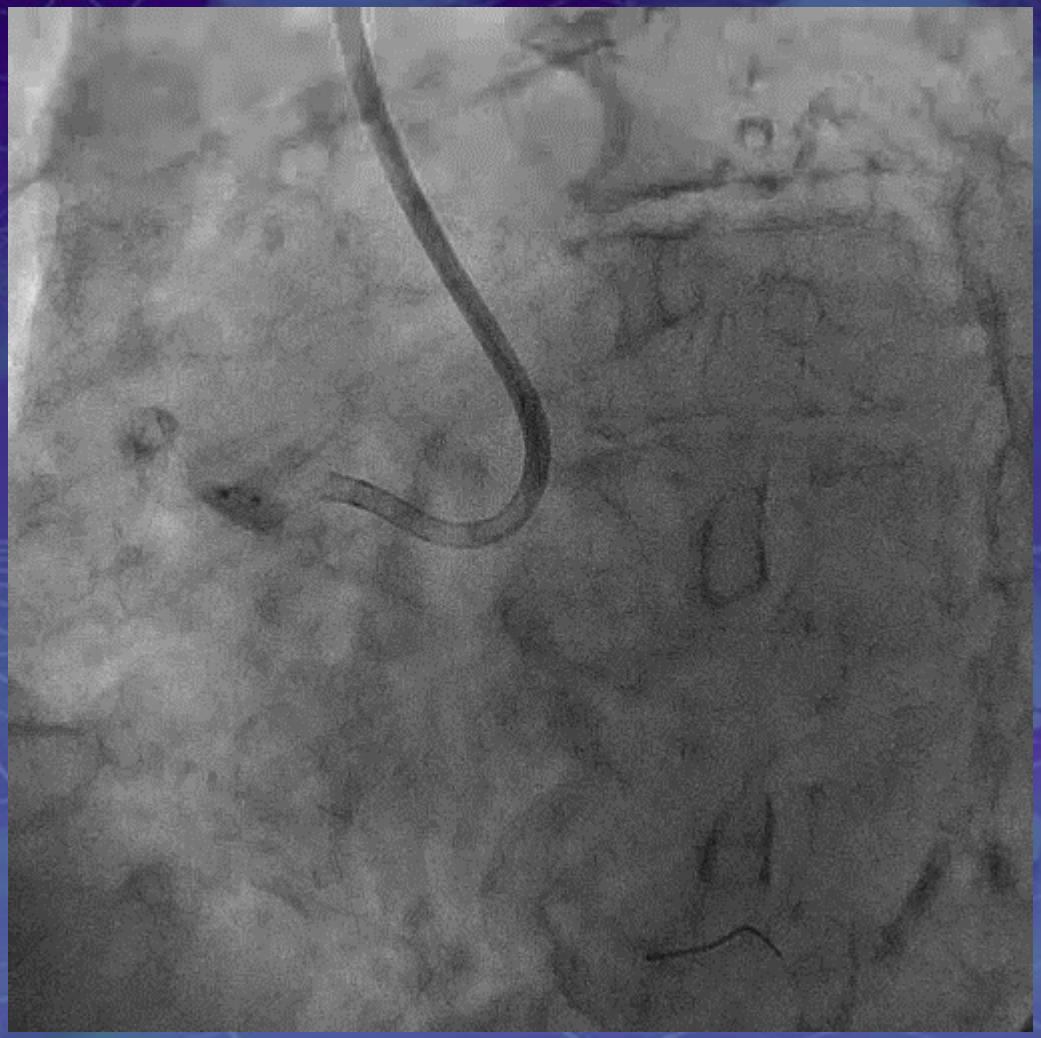
Embolization

- **Coil**
- **Tissue**
- **Sponge Gel**

Prepare Pericardiocentesis

Neutralize heparin

PCI for RCA-CTO



3.0x10mm balloon

① 480 sec
② 330 sec
③ 480 sec

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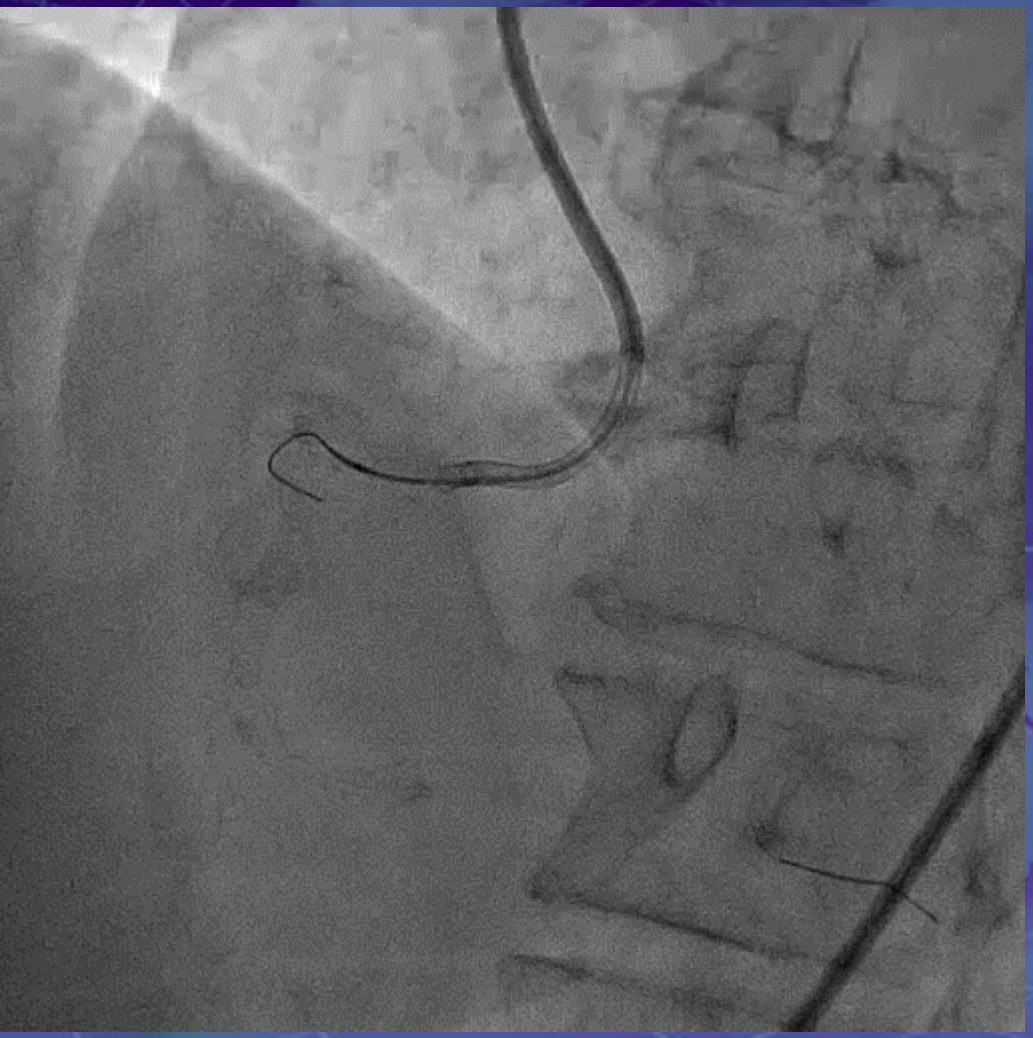
PCI for RCA-CTO



Perforation expanded even after the long inflation

Sponge Gel
Coil embolization
Covered stent

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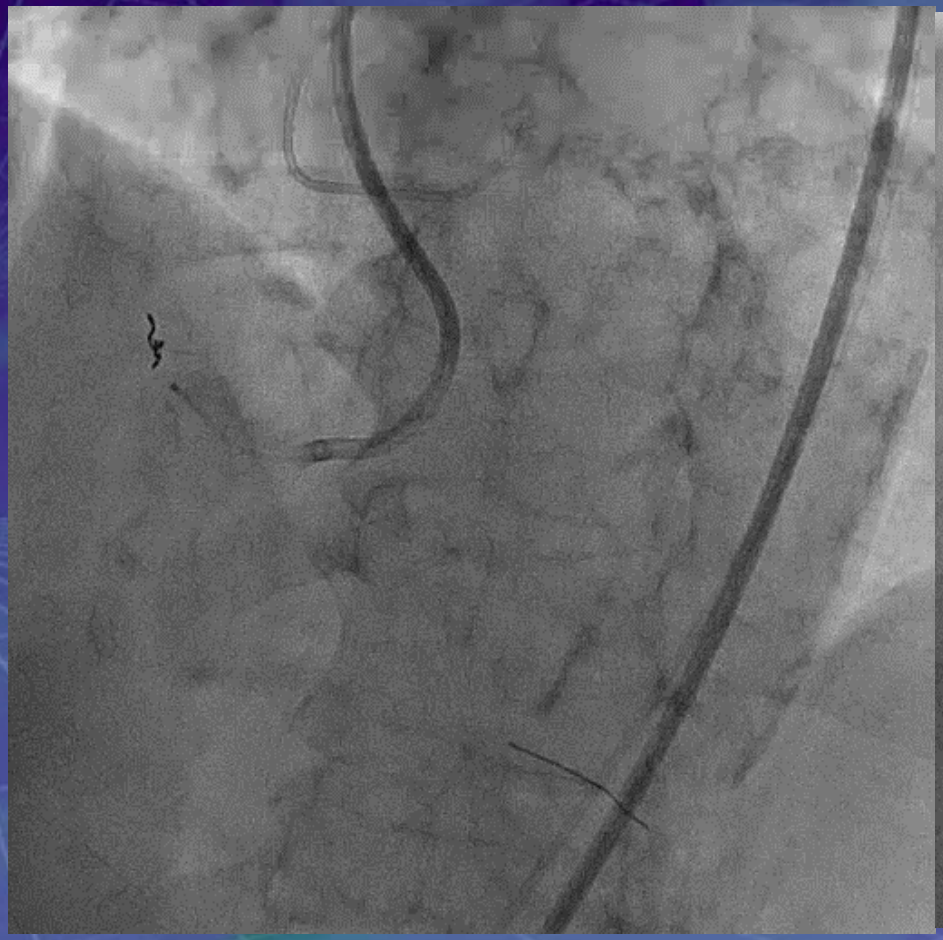
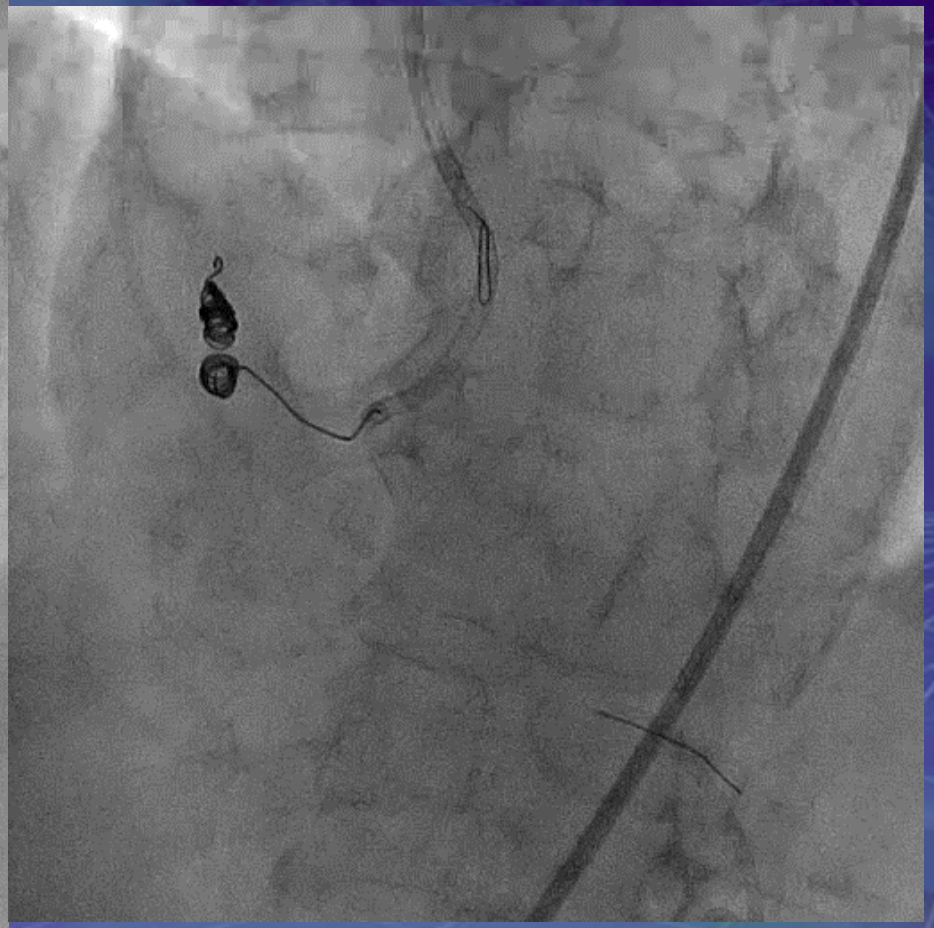
PCI for RCA-CTO





Helical Fibered Platinum Coilx3

Vortex Fibered Platinum Coilx1
IDC coil x2

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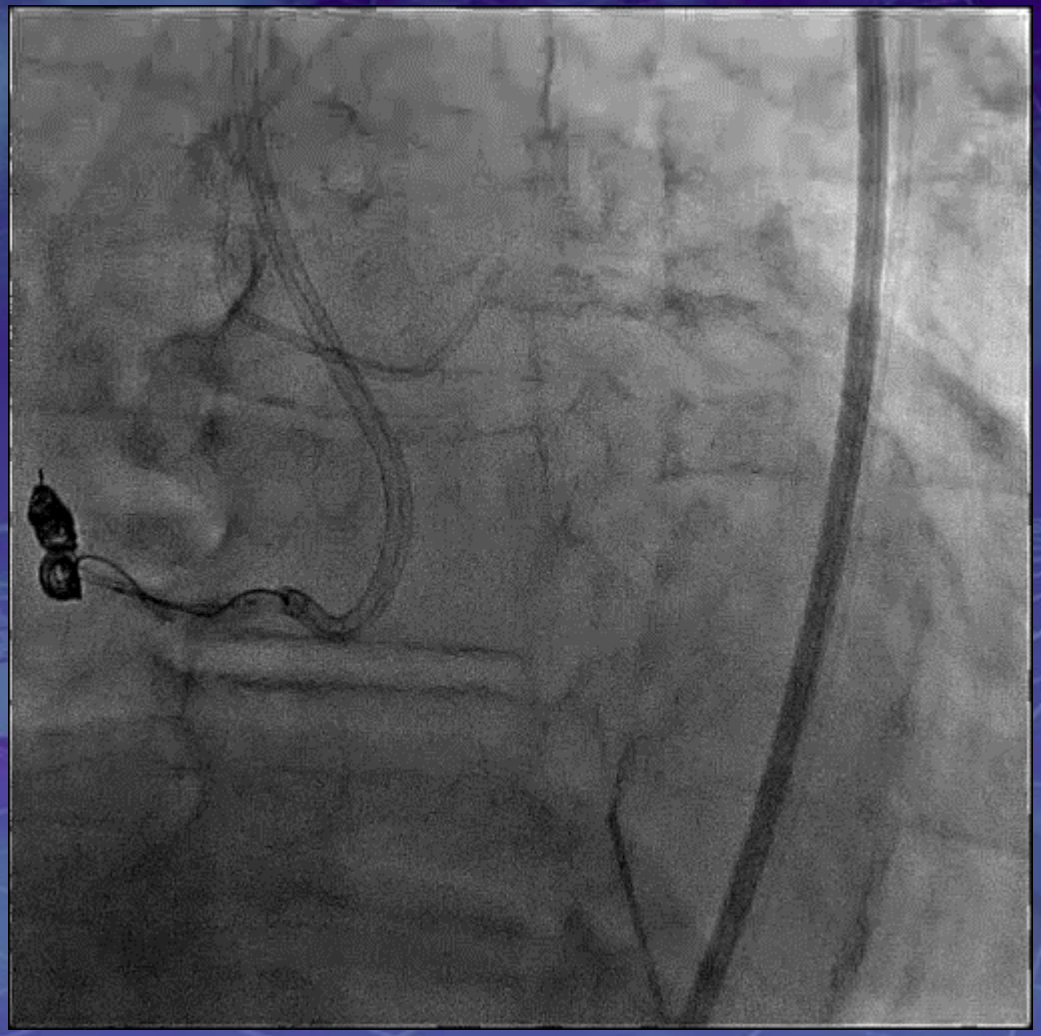
PCI for RCA-CTO

Cardiac tamponade developed

Pericardocentesis was performed



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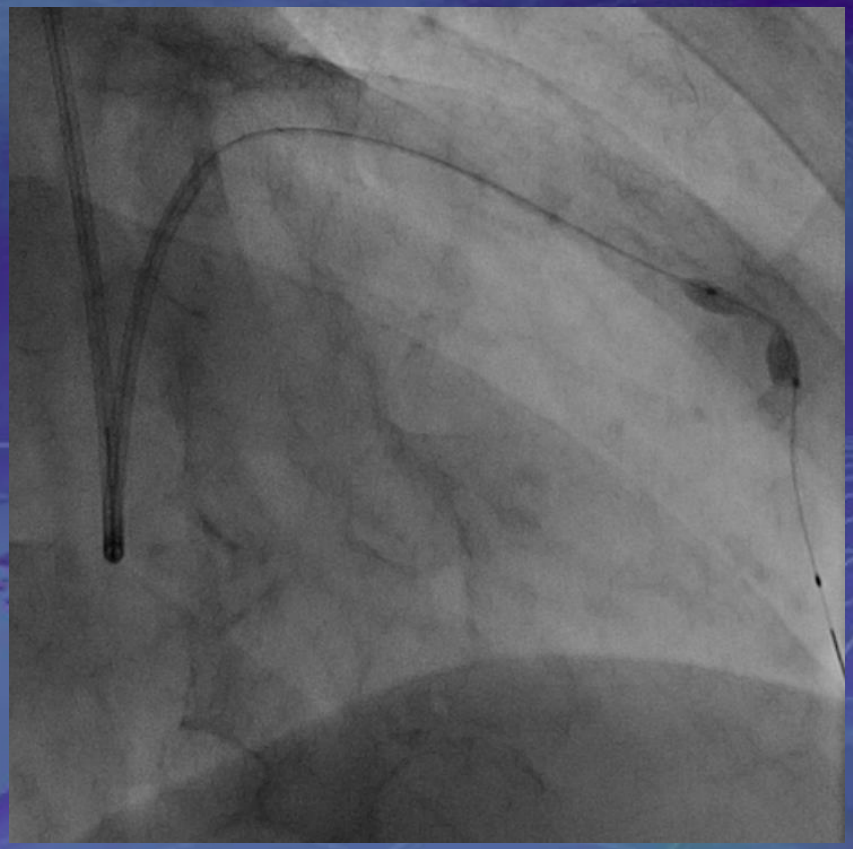
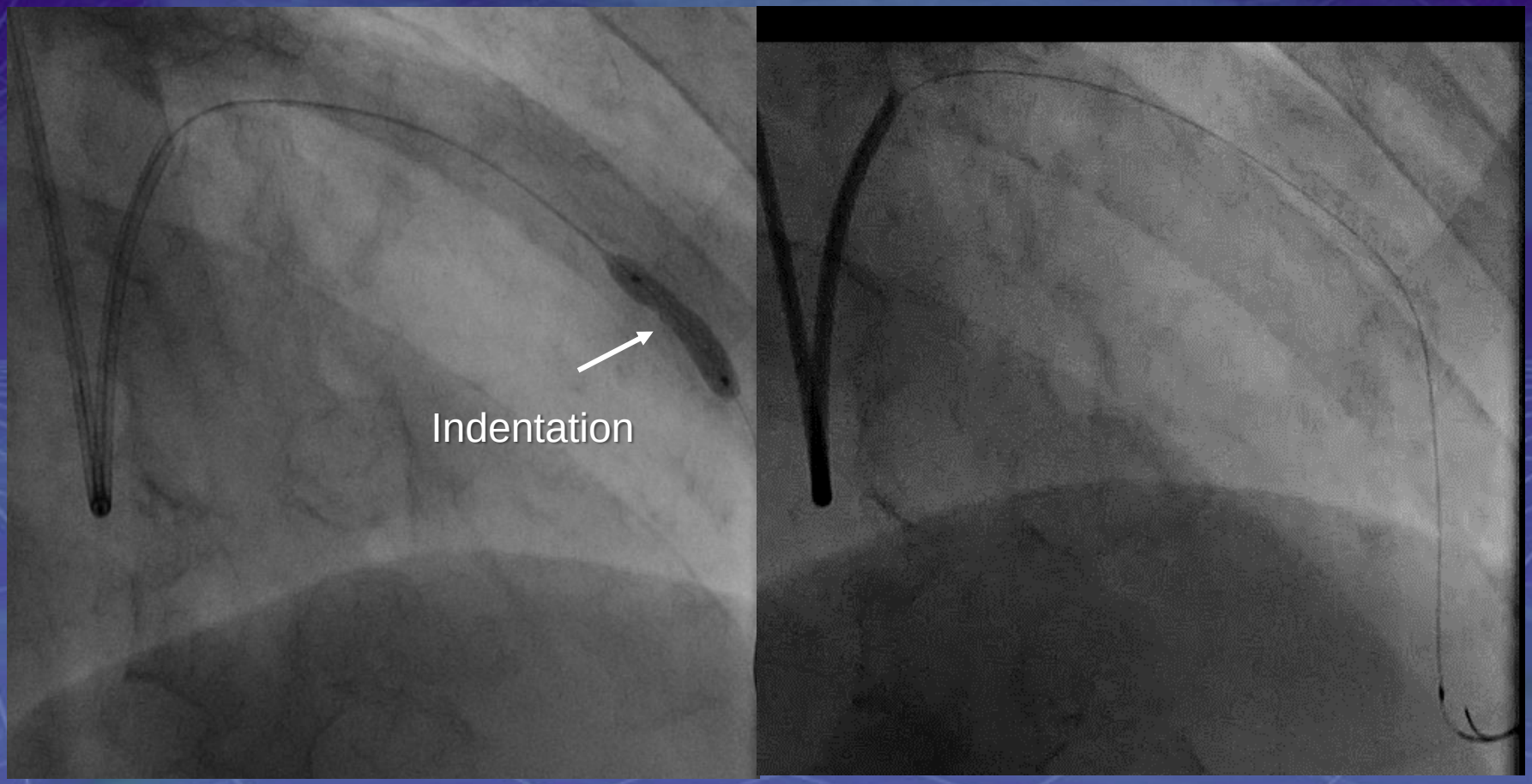
Stent induced perforation



Stent induced perforation

3.5/20mm was implanted by 9atm



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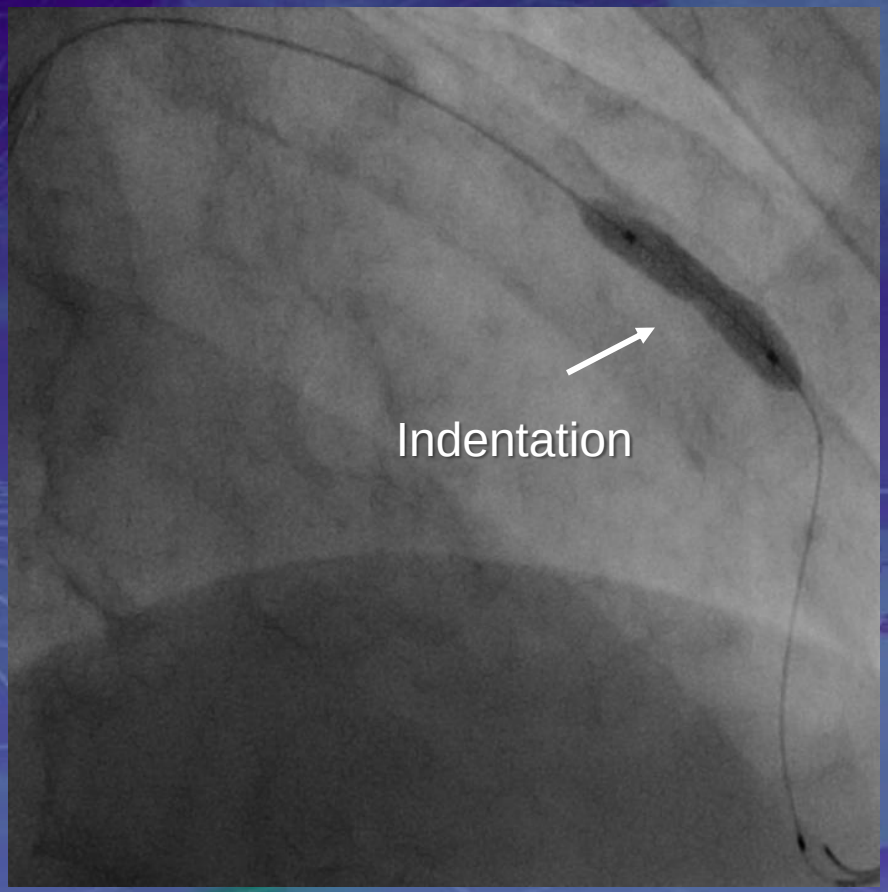
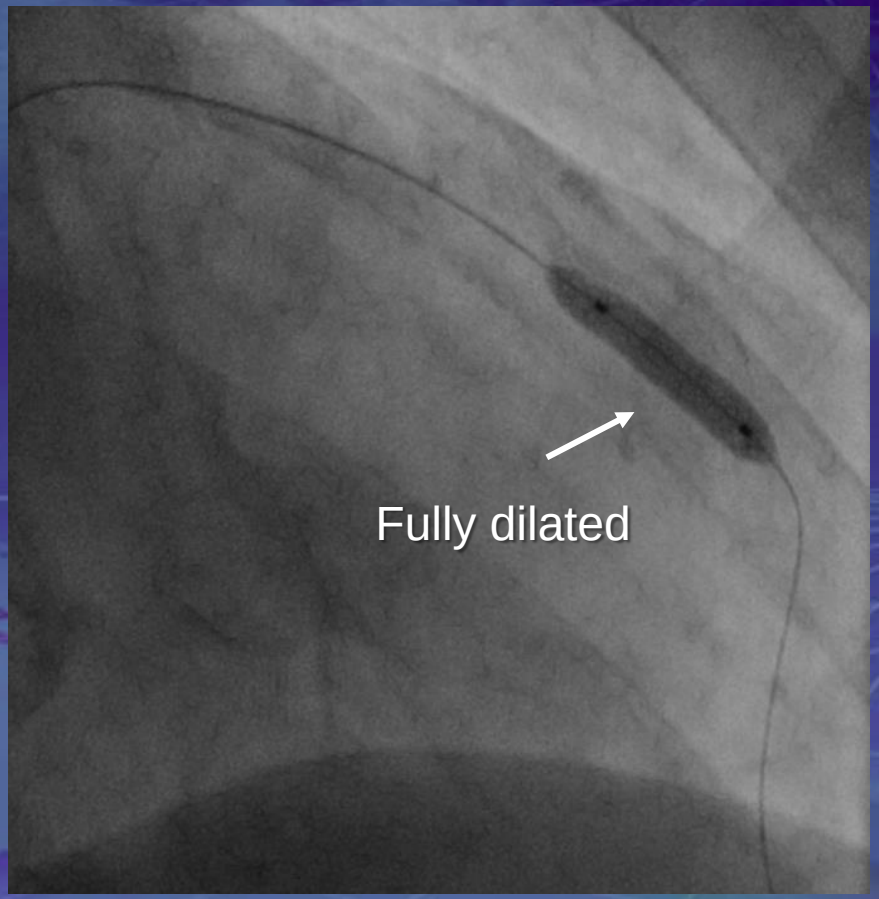
Stent induced perforation





Post 4.0/15mm, 20atm

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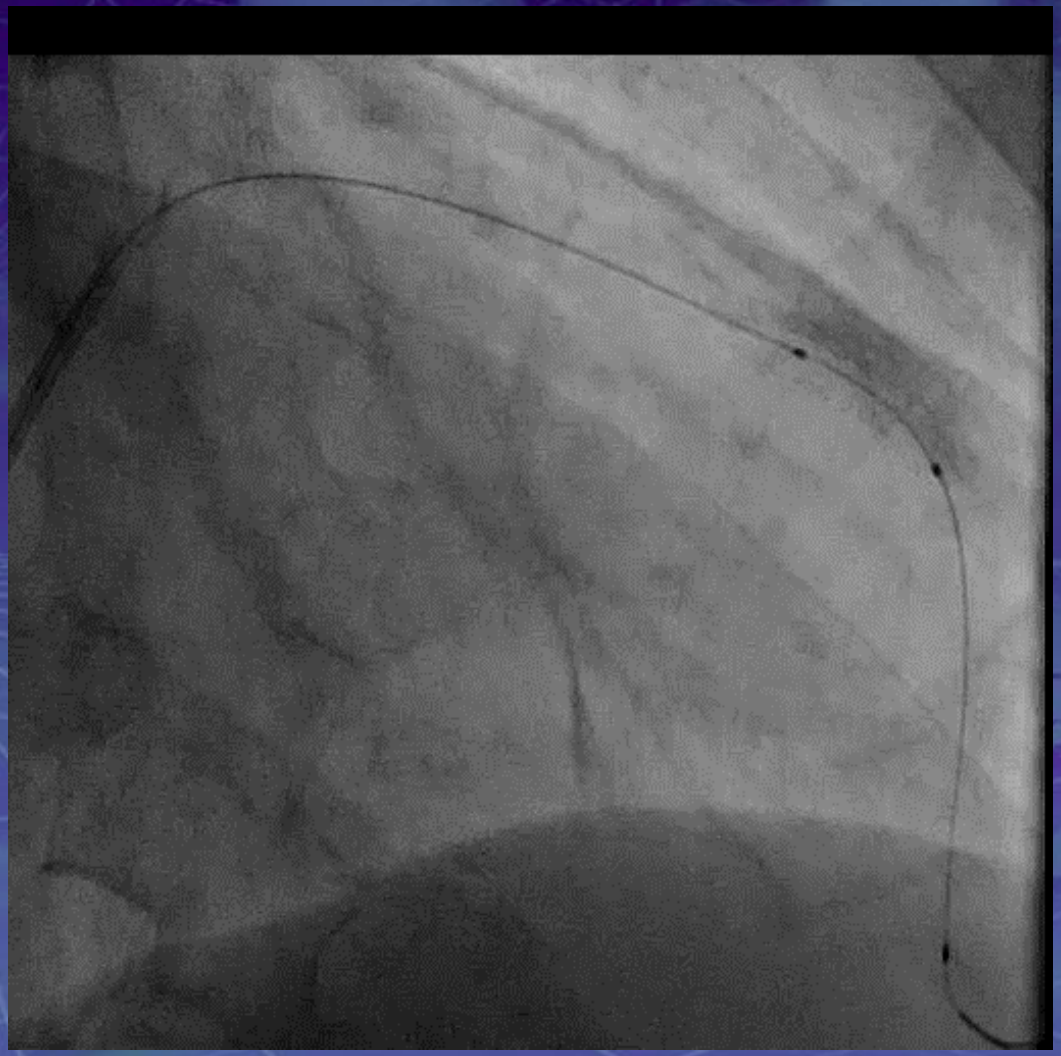
Stent induced perforation



Long inflation: not effective

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Next step?

Embolization

- **Coil**
- **Tissue**
- **Sponge Gel**

Covered Stent

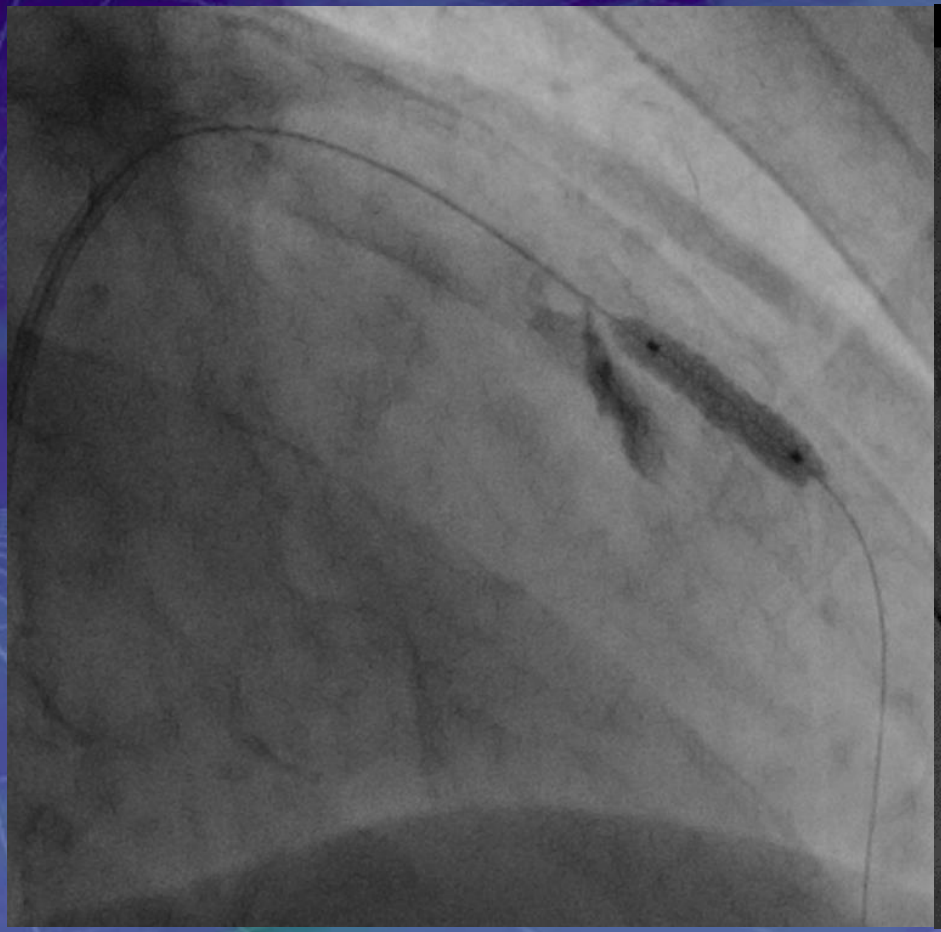
Prepare Pericardiocentesis

Neutralize heparin

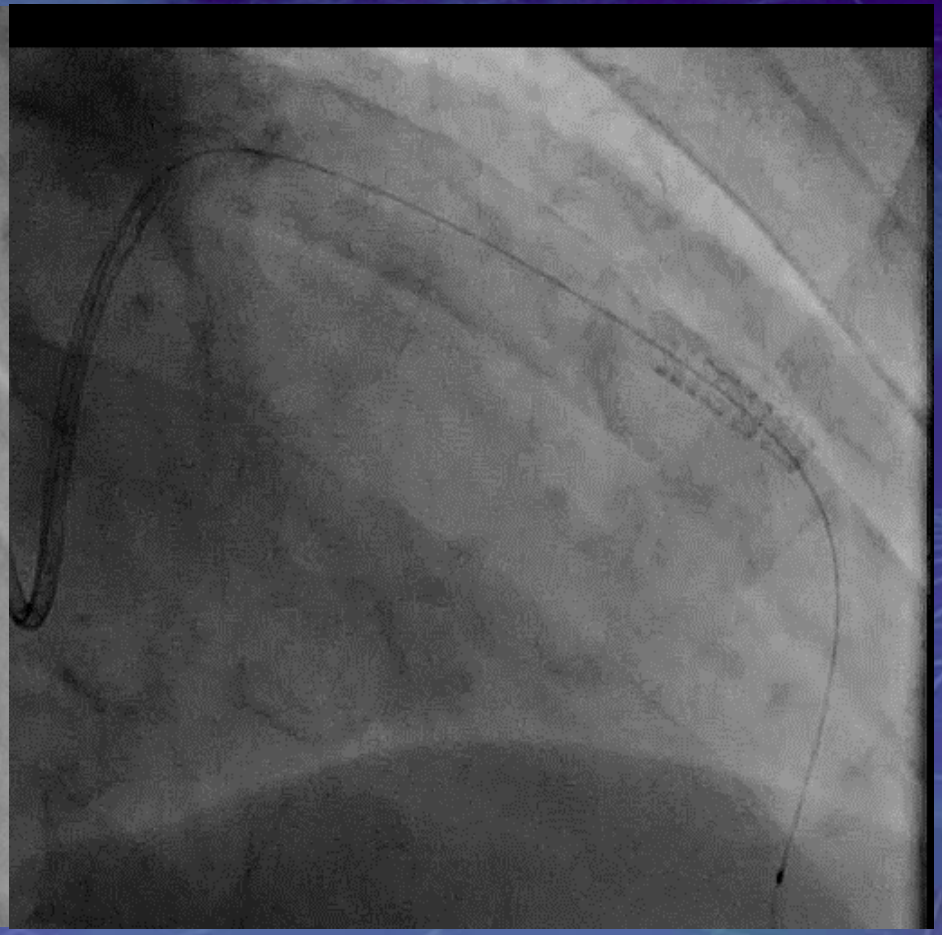
Covered stent

Graftmaster

Covered stent (GraftMaster)



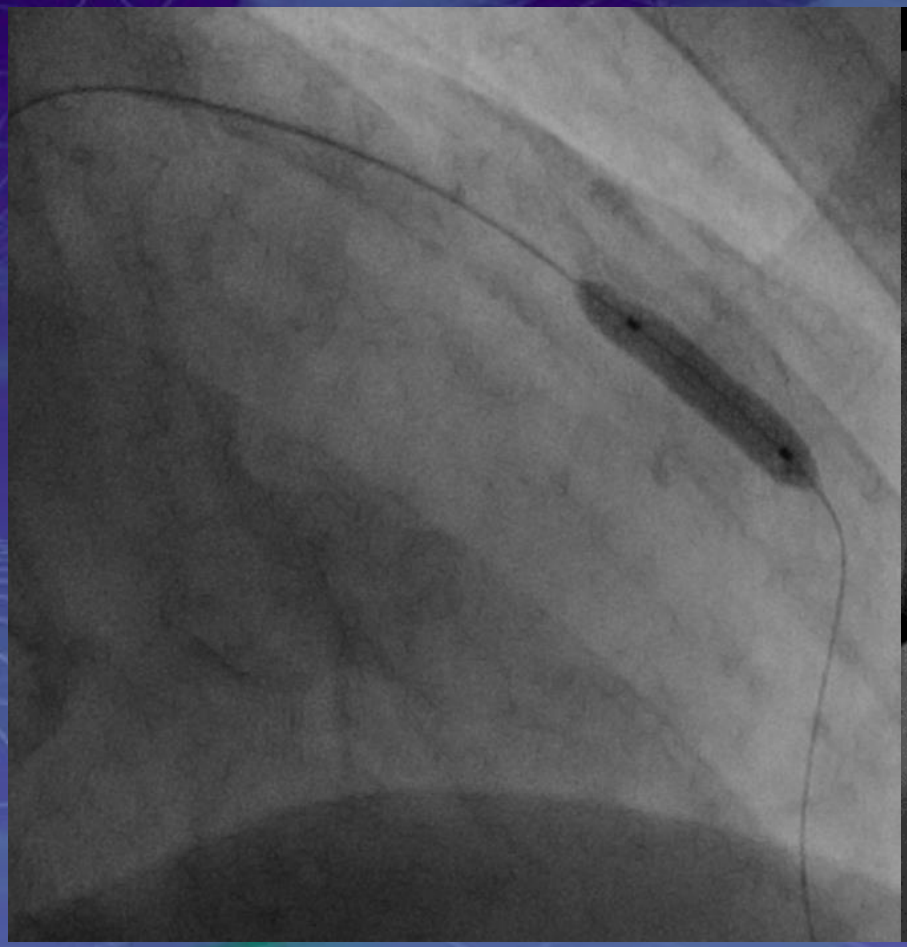
Graftmaster 3.0*16mm 20atm

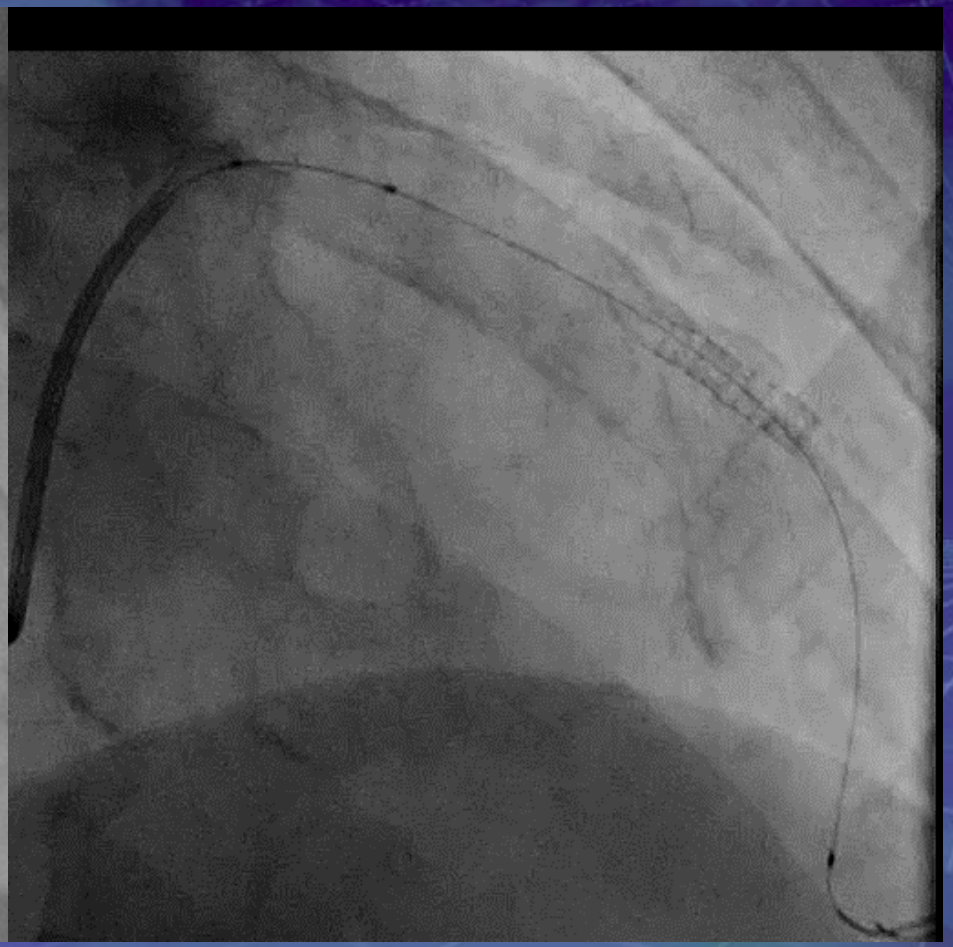


Post Graftmaster

Next step?

Covered stent (GraftMaster)





4.0/15mm, 16atm
Post dilatation is necessary

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Take Home Message

- ✓ *Do not miss the small perforation and need to check the final whole angiogram*
- ✓ *Keep your head and choose most effective procedure to get hemostasis*
- ✓ *Need to prepare the pericardiocentesis*

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Thank you!