

# Endovascular Strategy for Aorto-iliac Occlusive Disease: Patient selection and best approach

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# TASC classification of aorto-iliac disease

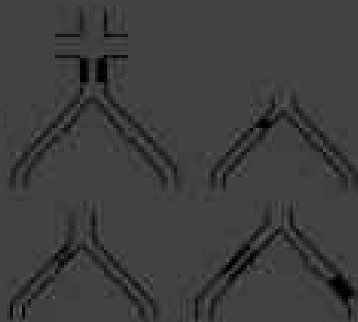
## Type A lesions

- Unilateral or bilateral stenosis of CIA
- Occlusion of external iliac artery (EIA) with stenosis of CIA



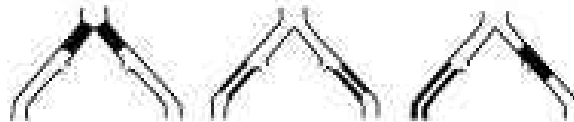
## Type B lesions

- Short (10cm) stenosis of internal aorta
- Diffuse CIA occlusion
- Single or multiple stenosis totaling 3-10 cm involving the CIA not extending into the CFA
- Moderate EIA occlusion not involving the origin of internal iliac or CFA



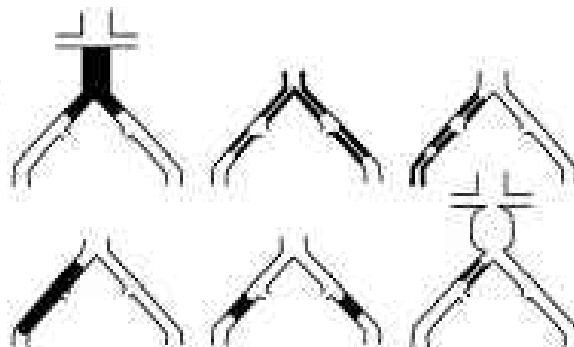
## Type C lesions

- Bilateral CIA occlusions
- Bilateral EIA stenosis 3-10 cm long not extending into the CFA
- Unilateral EIA stenosis extending into the CFA
- Unilateral EIA occlusion that involves the origins of internal iliac and/or CFA
- Heavily calcified unilateral EIA occlusion with or without involvement of origins of internal iliac and/or CFA



## Type D lesions

- Intra-aortic atherosclerotic occlusion
- Diffuse disease involving the aorta and both iliac arteries requiring treatment
- Diffuse multiple stenoses involving the unilateral CIA, EIA, and CFA
- Unilateral occlusions of both CIA and EIA
- Bilateral occlusions of EIA
- Iliac stenosis in patients with AAA requiring treatment and not amenable to endograft placement or other lesions requiring open aortic or iliac surgery



## What are the TASC classifications based on?

- “The determination of the best method of revascularization for treatment of symptomatic peripheral arterial disease (PAD) is based upon the balance between **risk of a specific intervention** and the **degree and durability of the improvement** that can be expected from this intervention.”
- ... operator experience and outcomes...

Proposed alternative basis of decision making:

- Operator experience/outcomes
- Initial success rate
- Initial morbidity/mortality
- Long-term patency
- Failure mode
- Failure options

# “Modern” aorto-iliac intervention

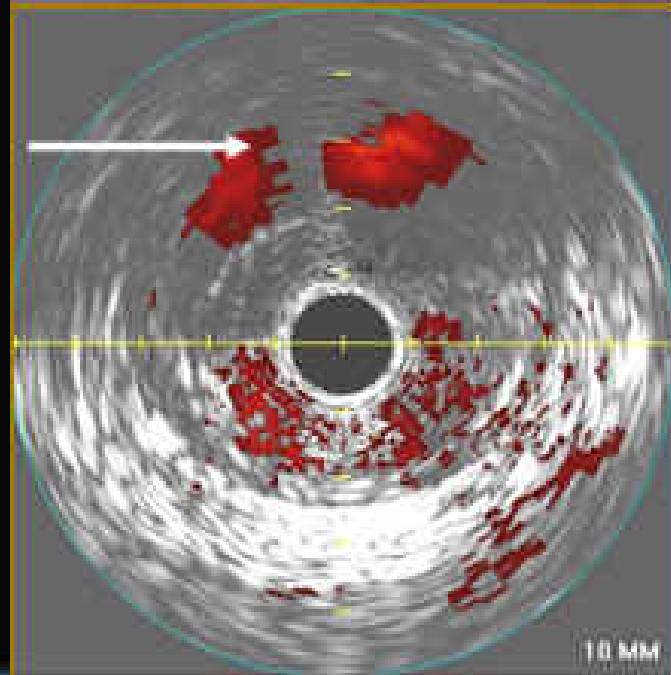
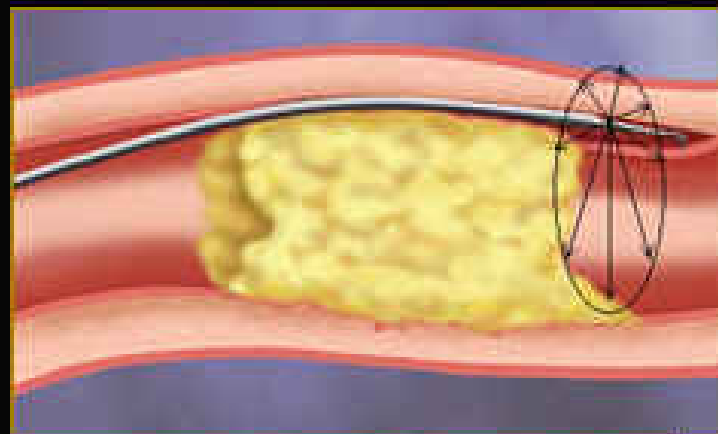
- Initial success rate:
  - >90% in most cases
- Initial major morbidity/mortality
  - Low (~1%-3%)
- Long-term patency
  - 5 year primary 70%-79%
  - Data not stratified by TASC type
- Failure mode
  - Limb threat is rare
  - Restenosis manageable
  - Perforation is largely manageable
- Failure options
  - Repeat intervention
  - Surgical option is always available

# Adjunctive tools to improve outcomes

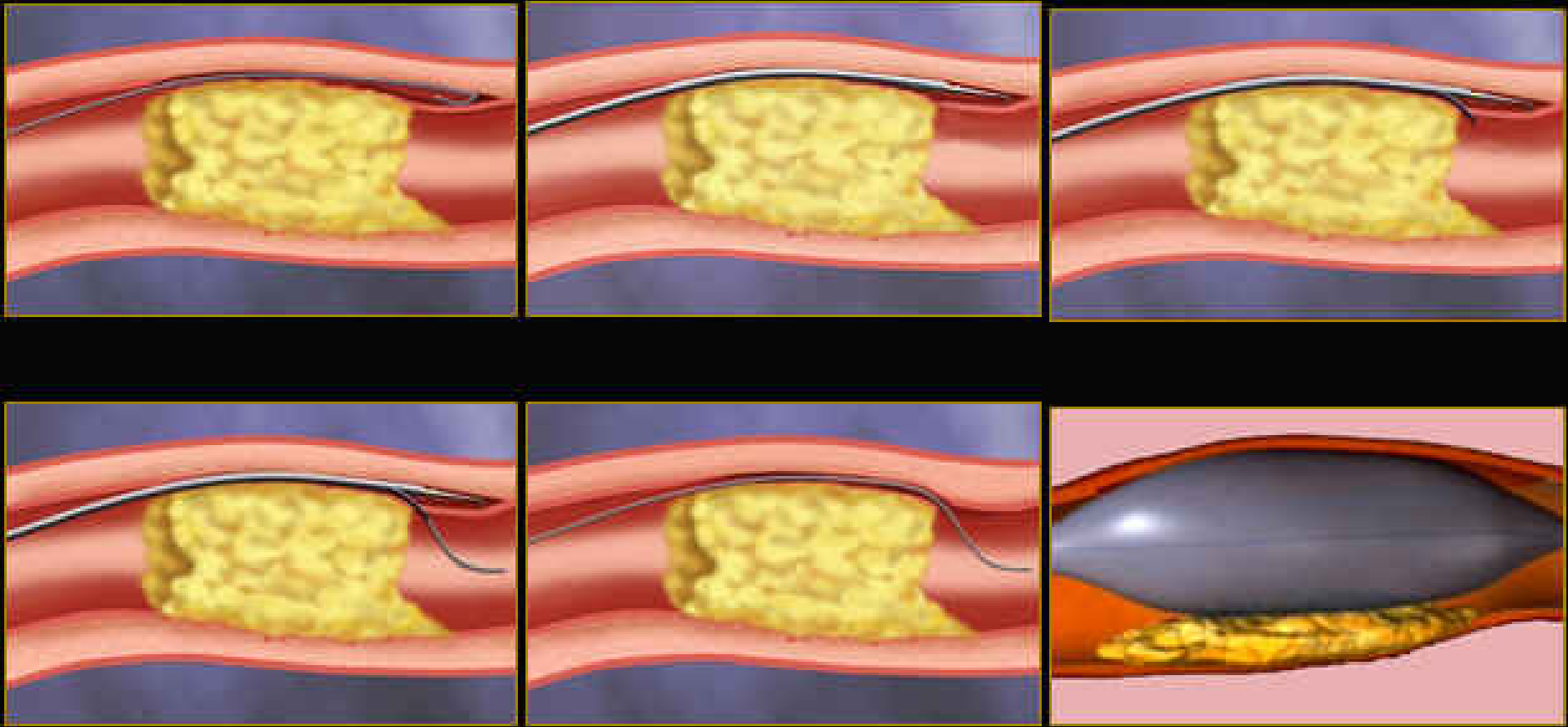
- **Stents**
  - Improve initial success rates
  - Probably improve long term patency
- **Re-entry catheters**
  - Improves success of long/calcified occlusions
  - Pioneer (8F ultrasound guided)
  - Outback (6F fluoroscopic guided)
- **Covered stents**
  - Management of perforation allows more aggressive approaches
  - Also useful for restenosis (?)
    - Self-expanding (Wallgraft, Viabahn, BARD)
    - Balloon-expandable (Atrium)
- **Occlusion balloons**



# Pioneer: lumen re-entry device



# Pioneer: lumen re-entry device



Proximal R iliac stenosis

Proximal "nipple"

Long occlusion CIA

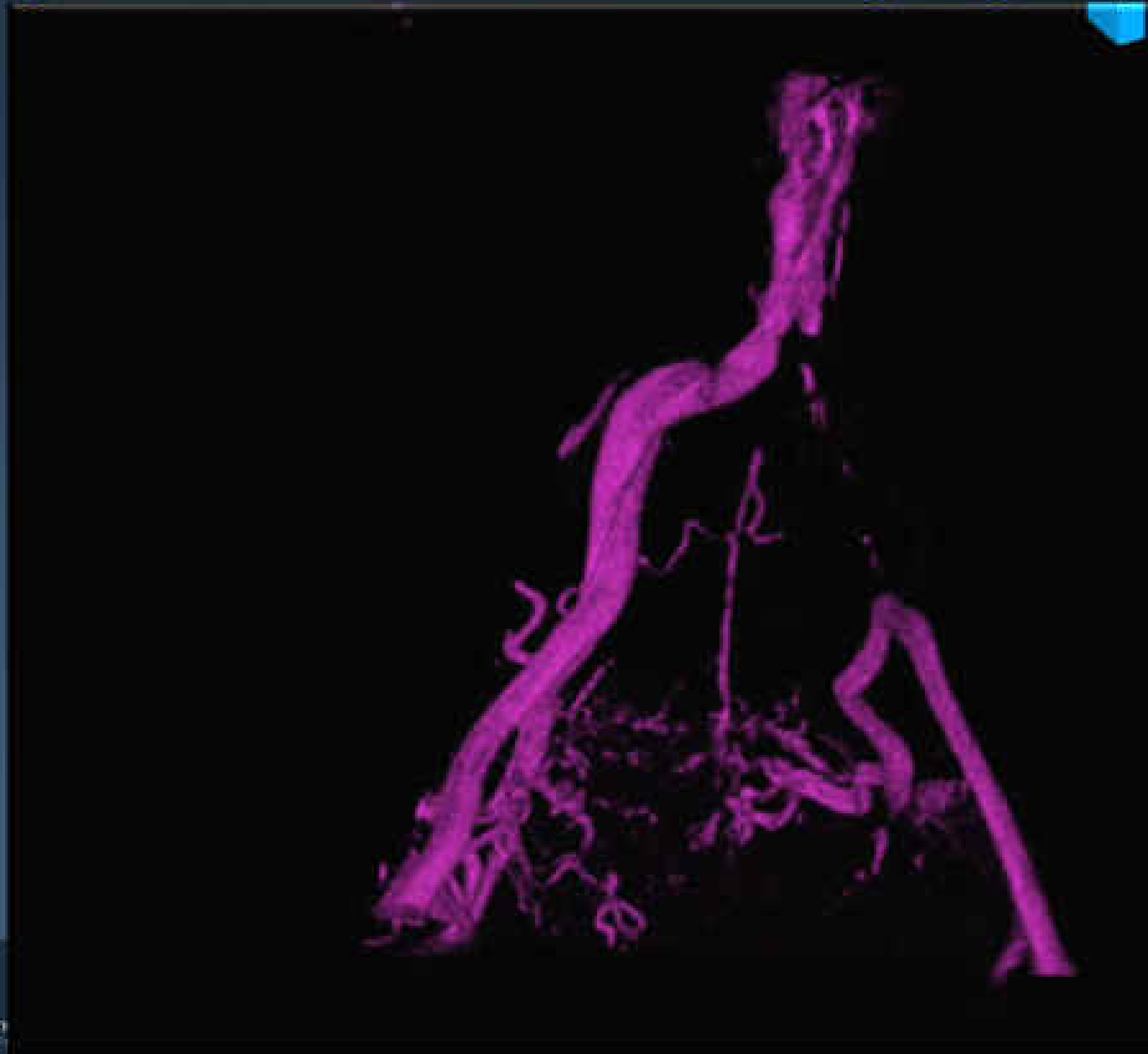
Good outflow vessel

TASC C





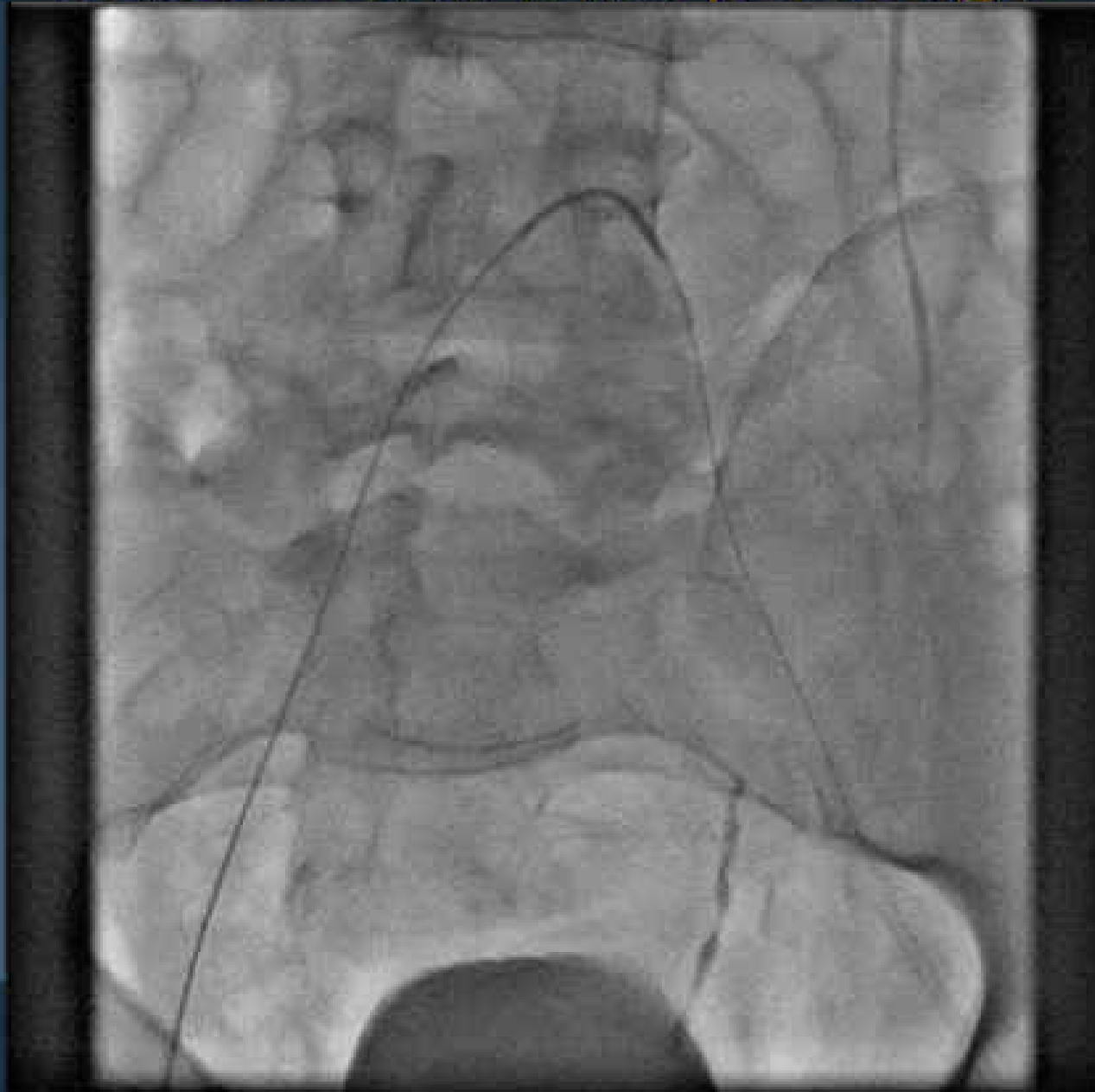
# Adjunctive rotational angiography



# Antegrade approach initially



# Successful wire passage



# Contralateral snare/wire externalized



# Bilateral sheaths across both iliacs



# Predilate occlusion with undersized balloon



# Position kissing stents



# Kissing stent deployment

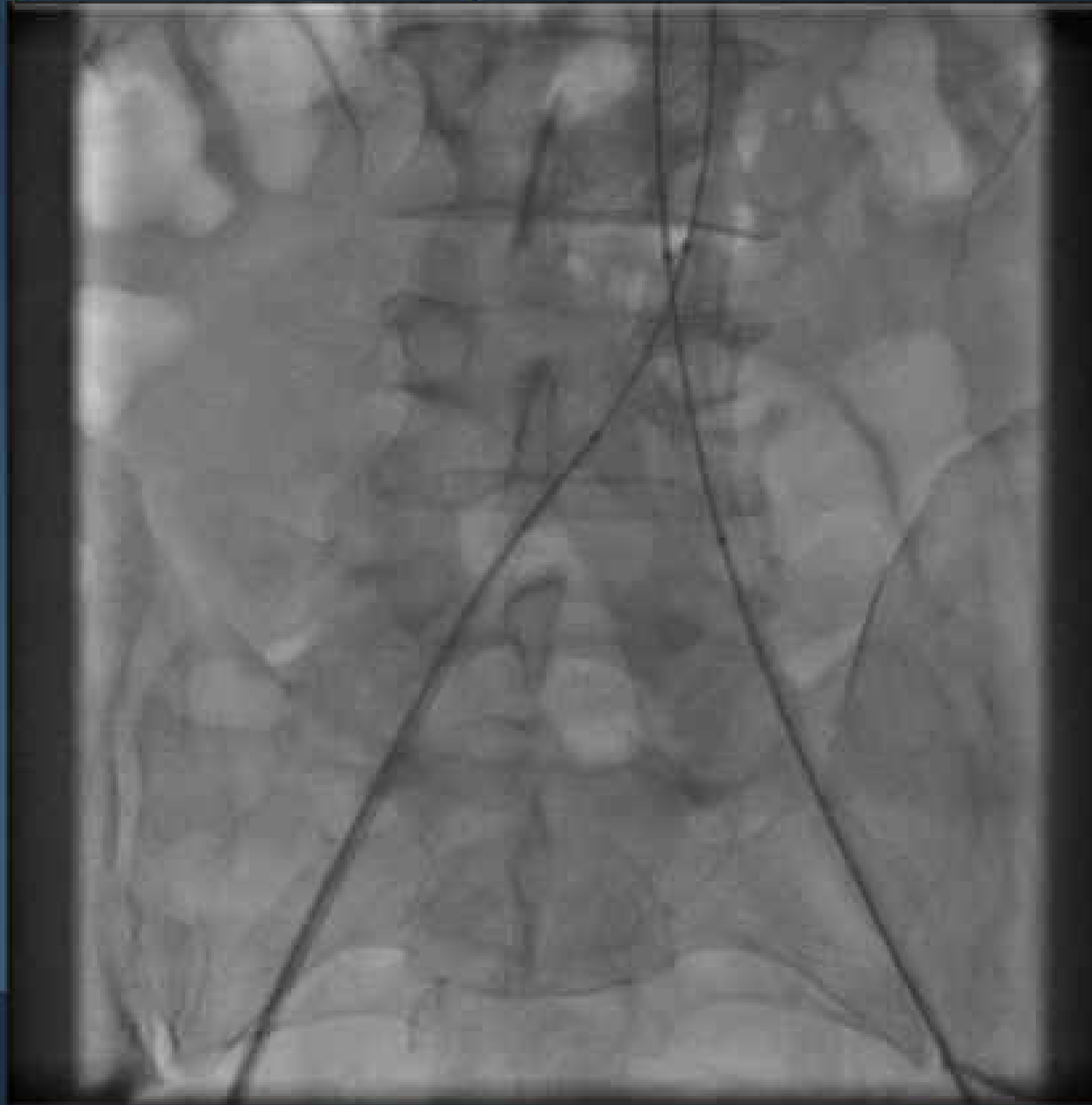


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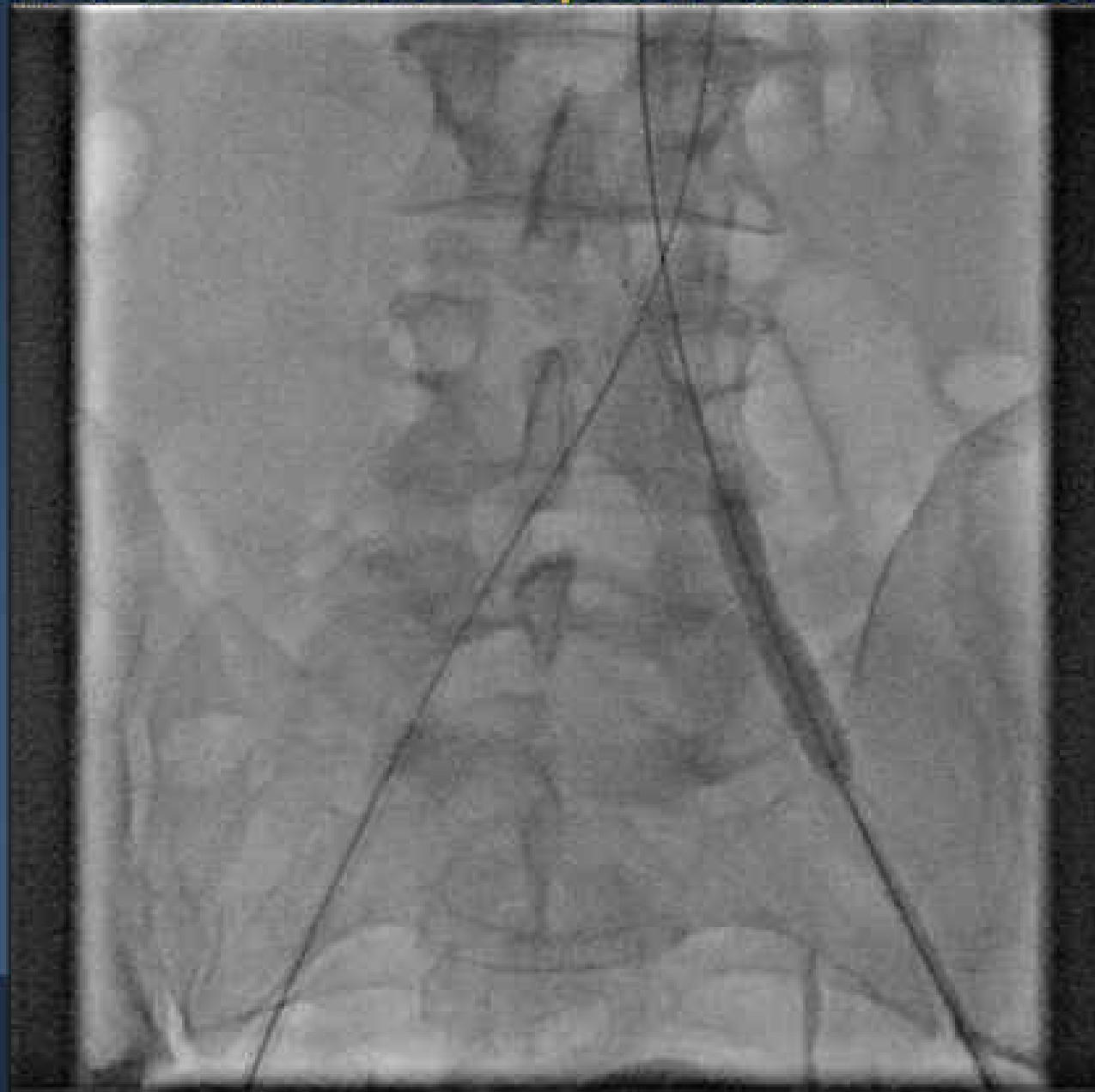
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# Angiogram: incomplete revascularization



# Second balloon-expandable stent EIA



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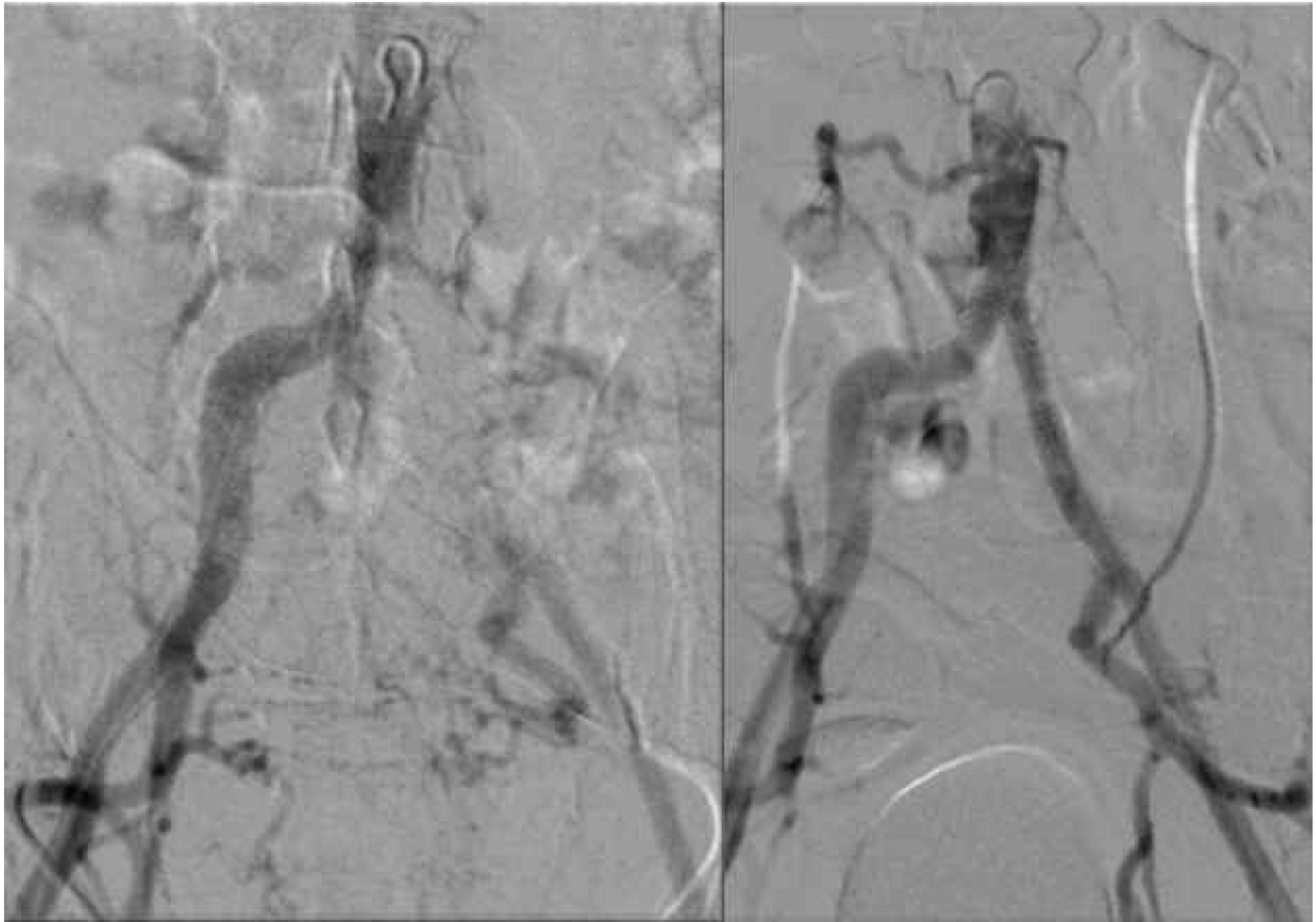
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# Completion angiogram

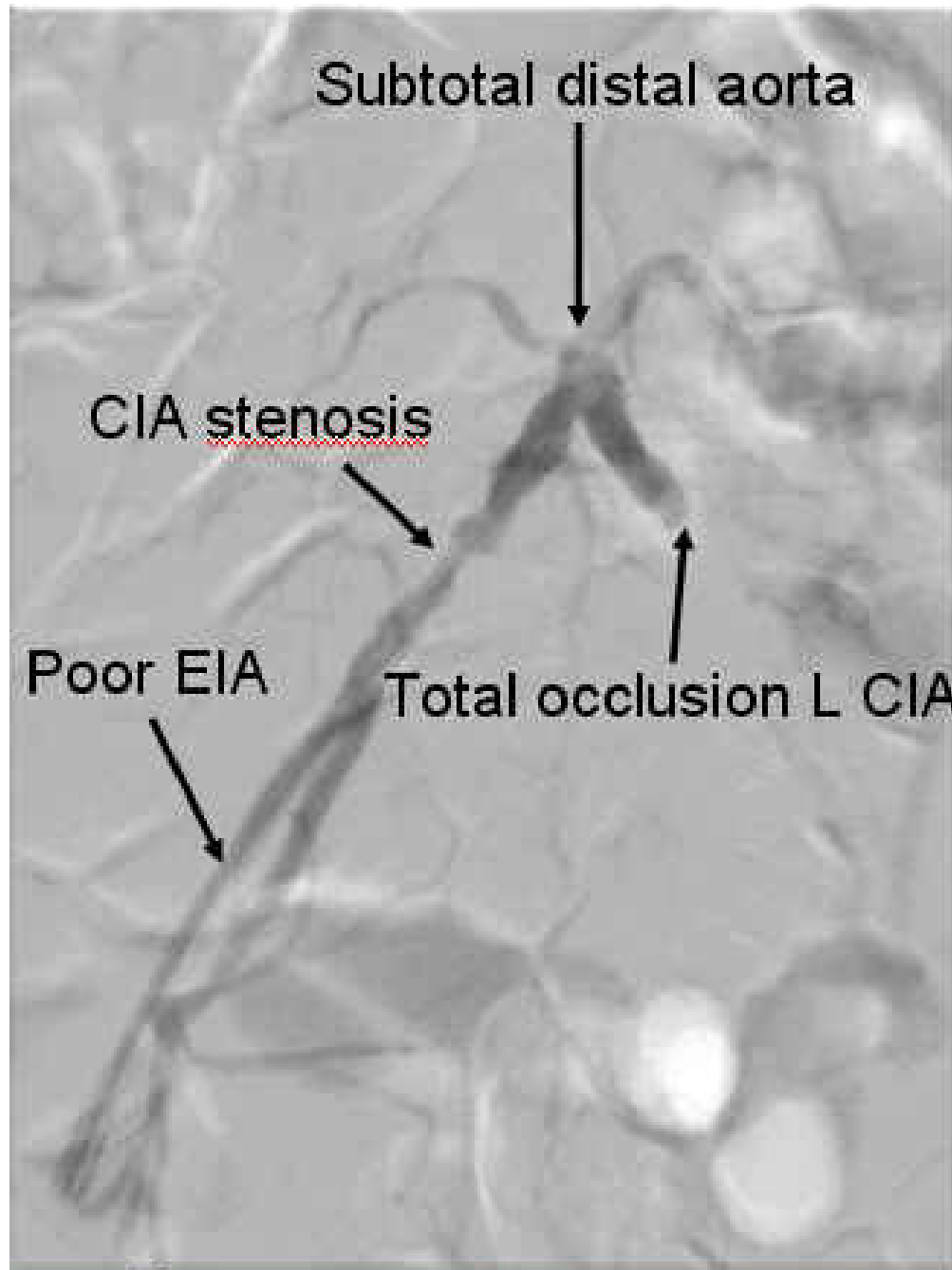


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# Aortoiliac CTO

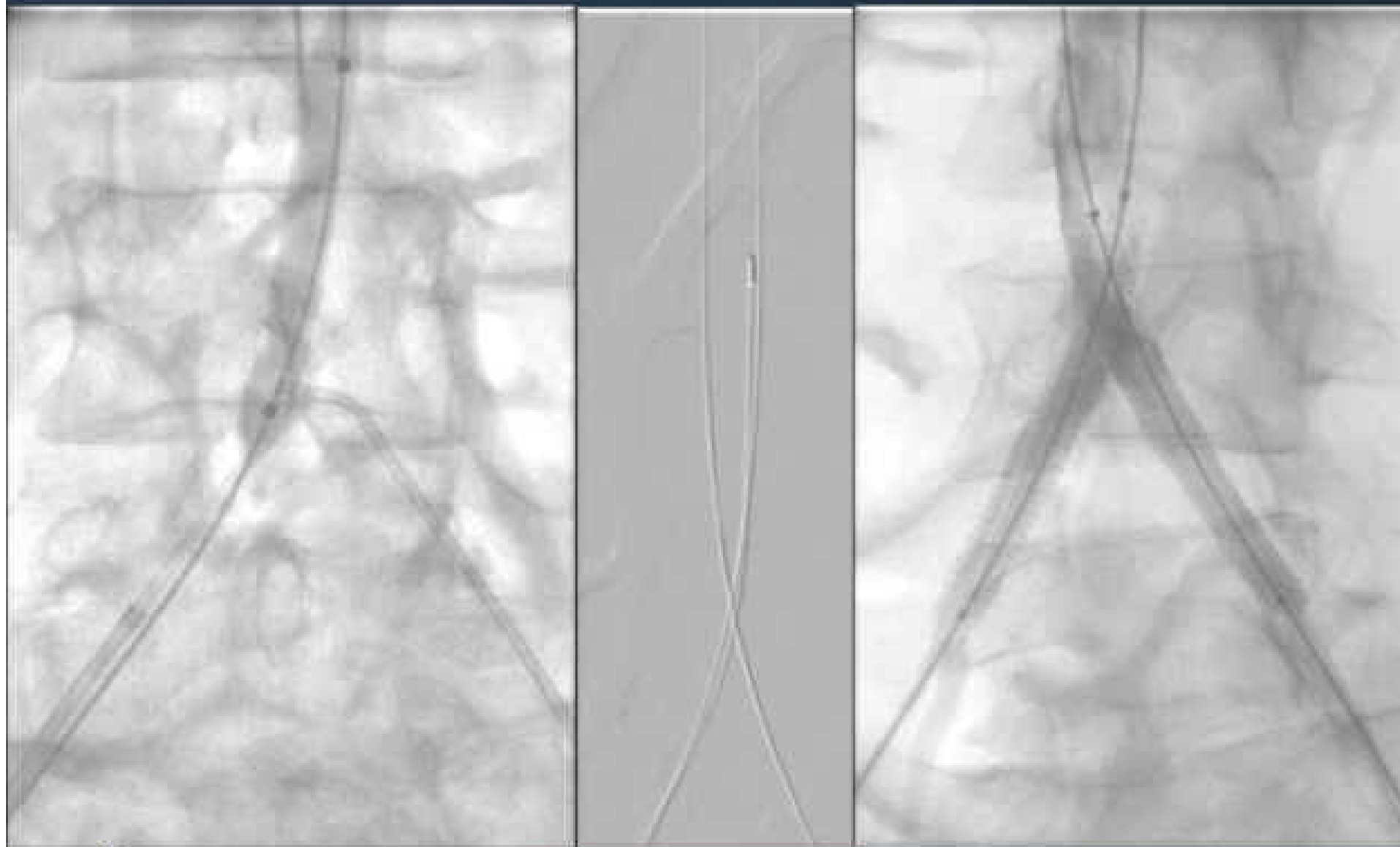


Successful CTO recanalization

Unable to cross aorta retrograde



# Brachial access: success

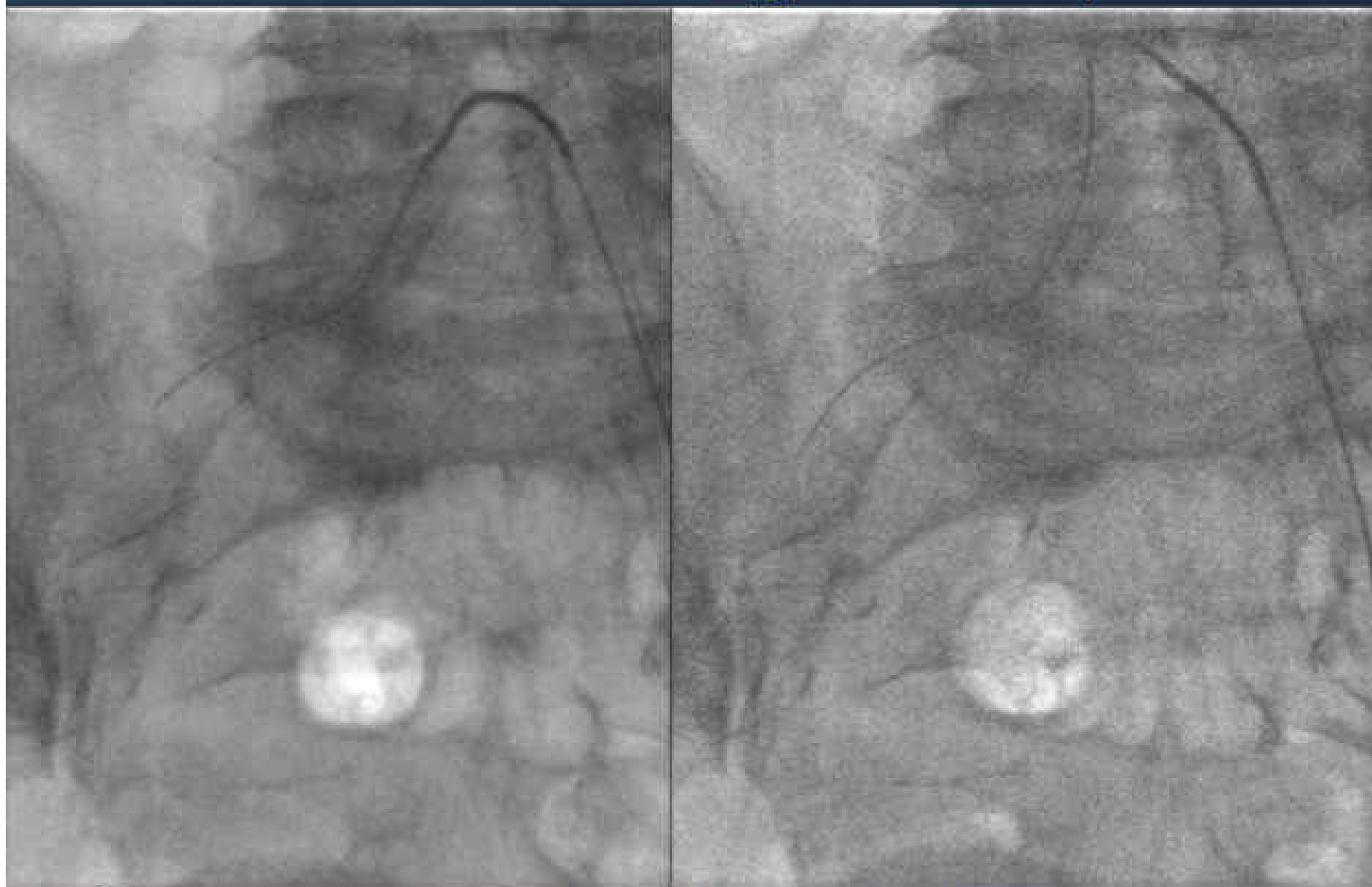


# Heavily calcified iliac CTO





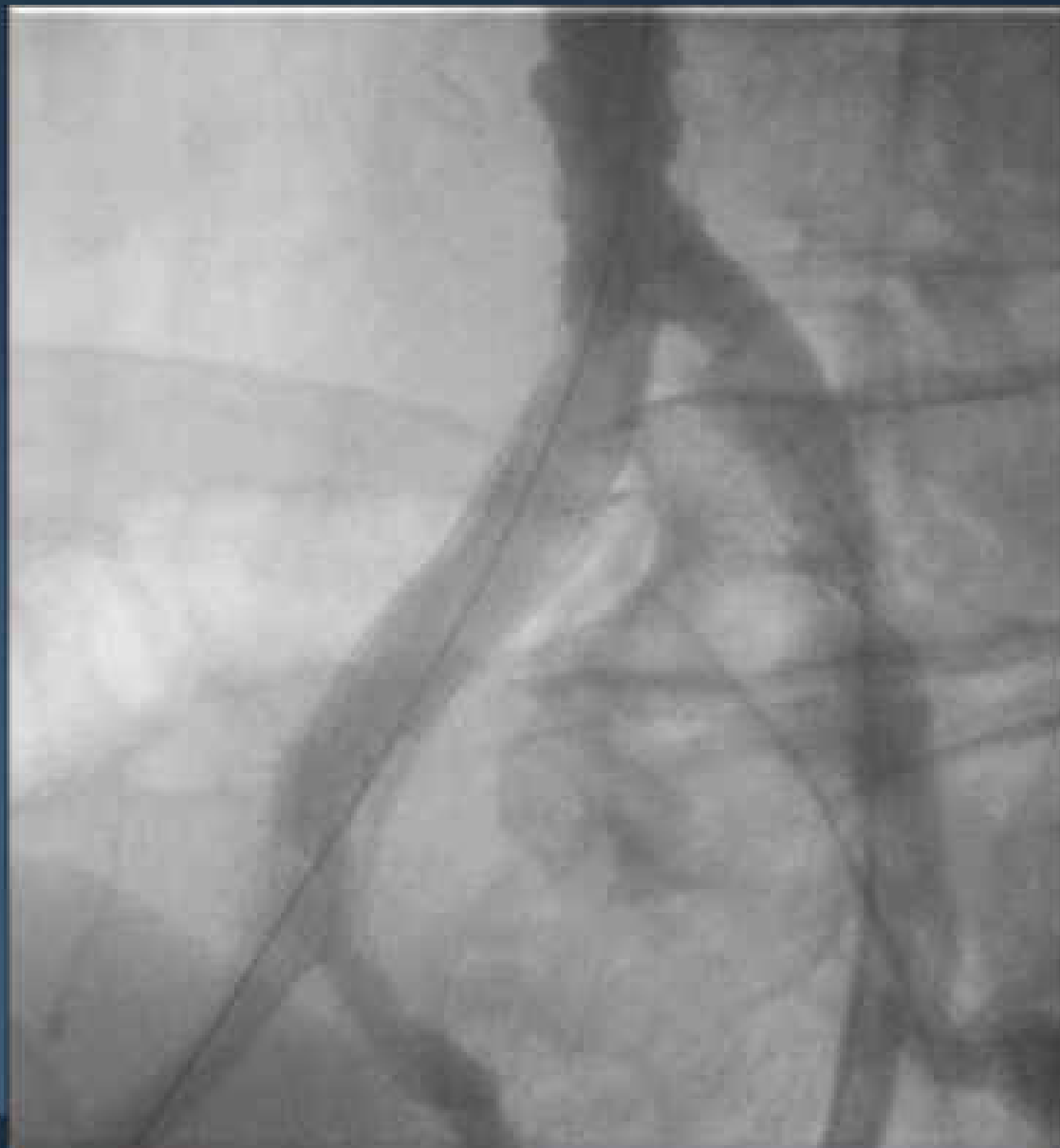
# Unsuccessful antegrade attempt



# Pioneer re-canalization



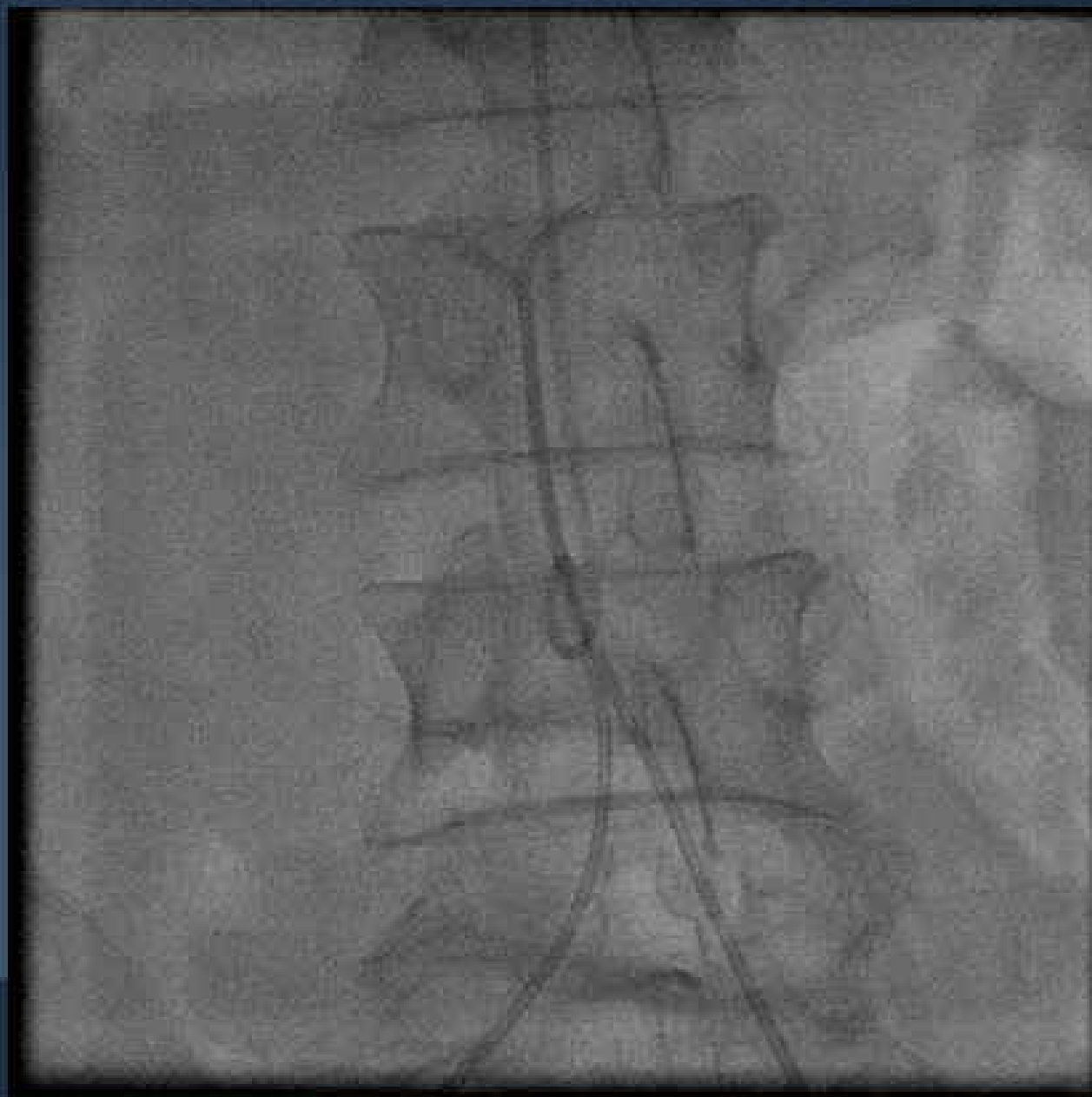
# Final result



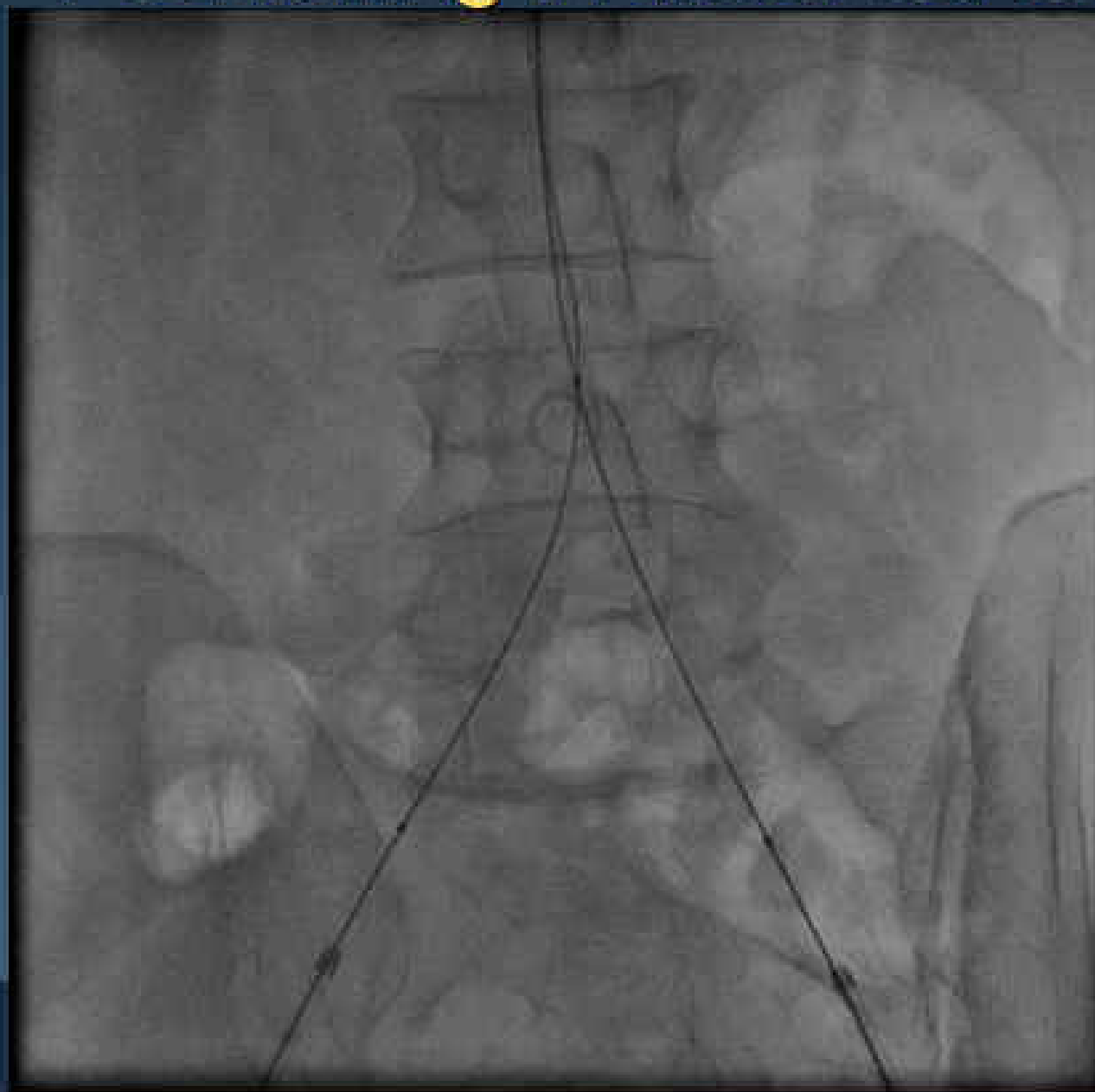
# TASC D: Leriche syndrome



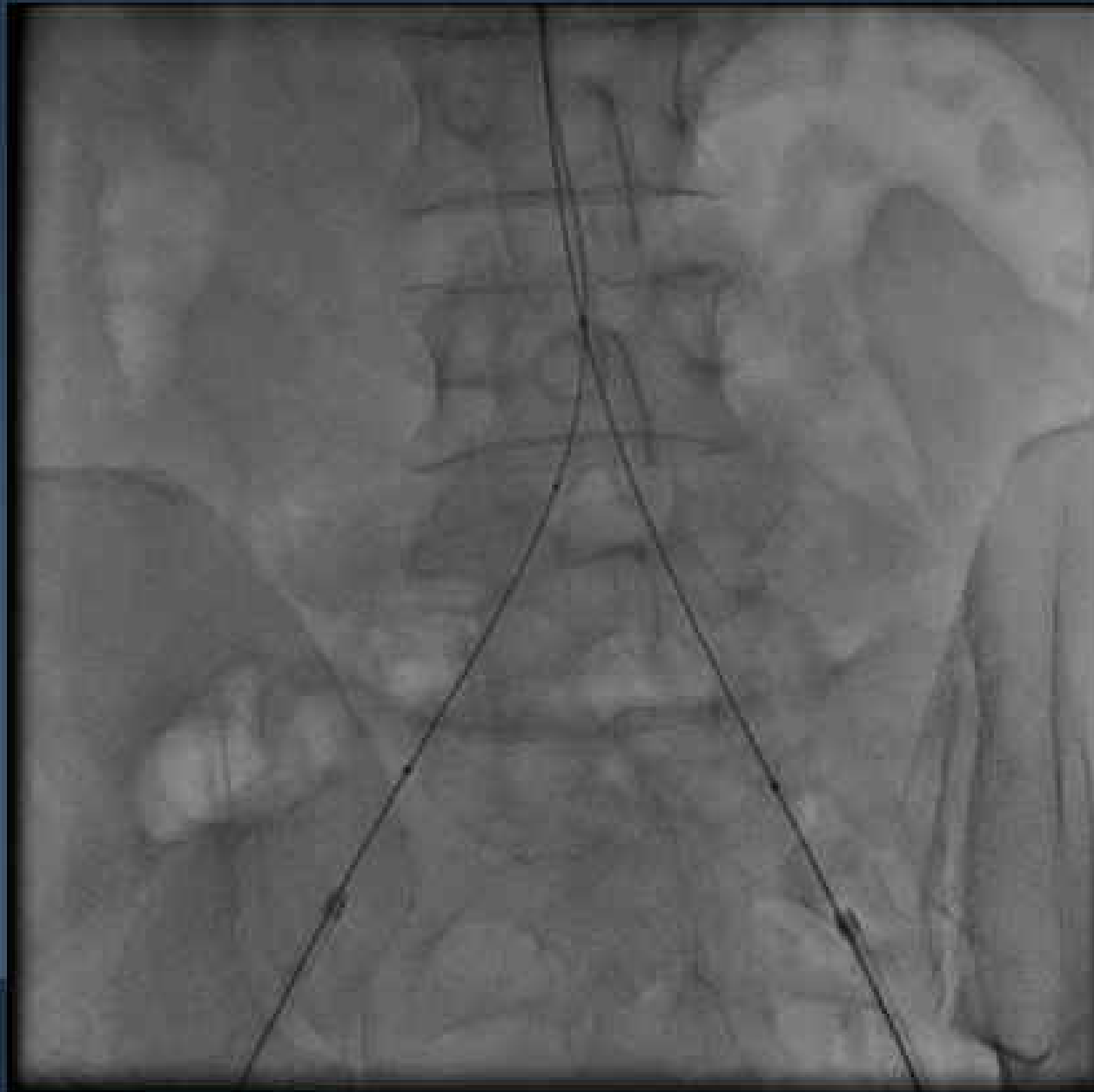
# Confirmation of true lumen re-entry



# Positioning in distal aorta



# Assessing hypogastric localization bilaterally

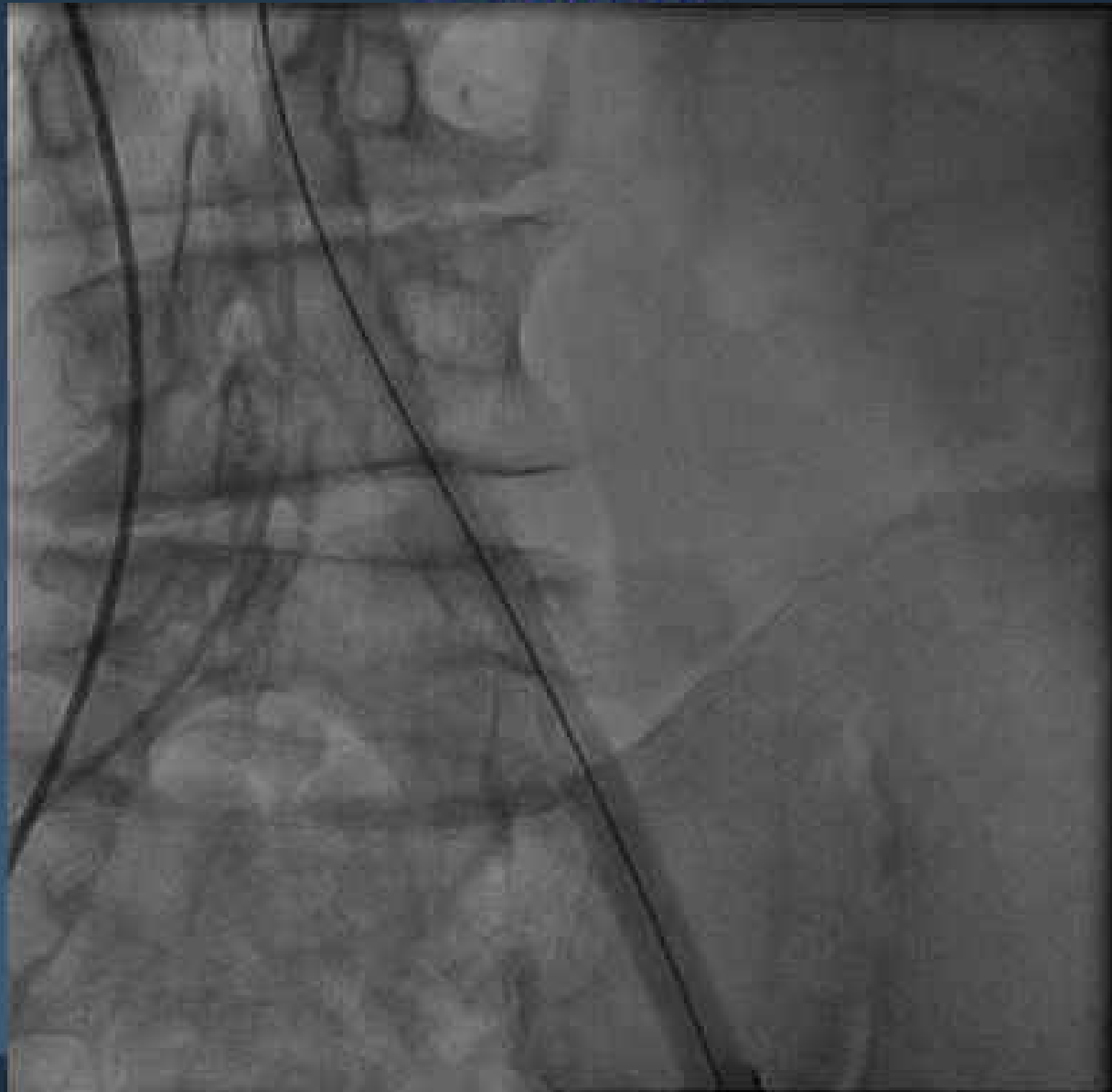


# Completion angiogram





# Caution



# Conclusions

- TASC C and D lesions are approachable via endovascular means
- Technology advances have allowed acceptable success and safety
- Any differences in durability compared to simpler TASC lesions remain to be determined



Thank you



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# Advances in Iliac Stenting

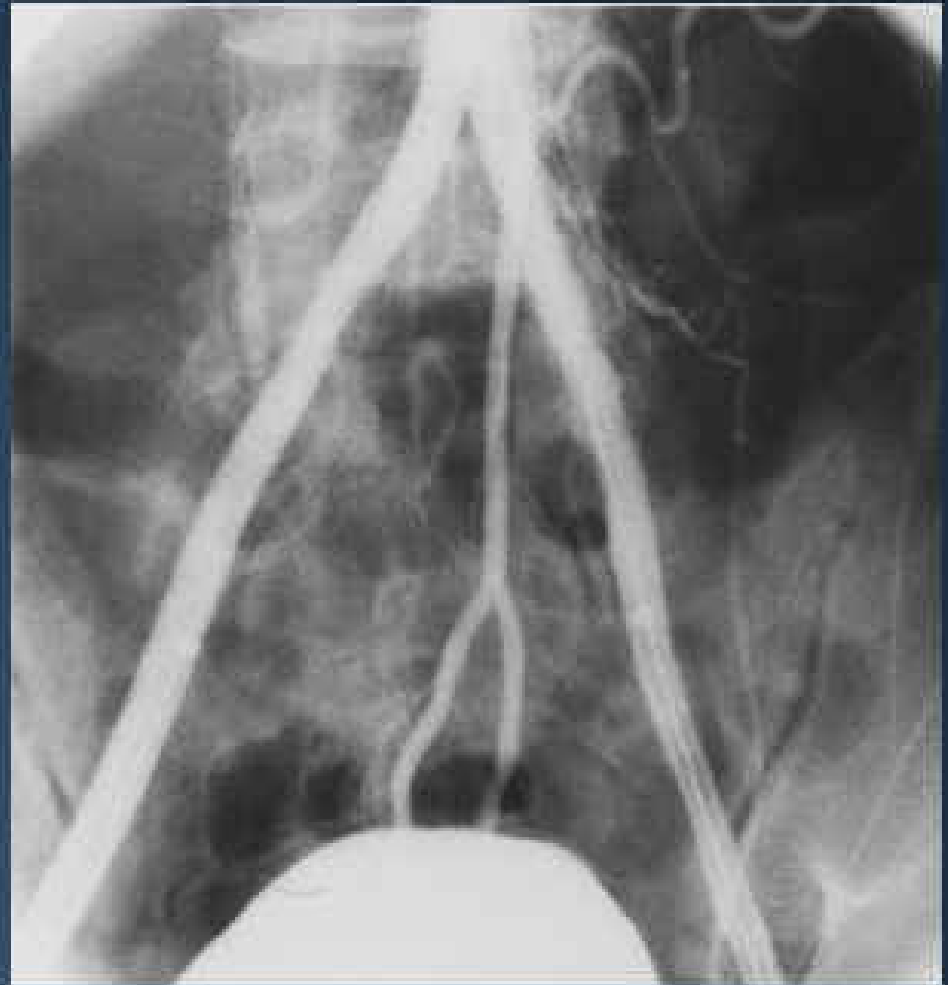


- Better results
- Reduced complications
- Expanded indications

# Bilateral Iliac Stenting TASC D



**Baseline**



**Final Result**

# Stent Selection

- **Balloon expandable:**
  - Aortoiliac bifurcation
  - Common iliac
  - Calcified lesions
  - Chronic occlusions?

- **Self expanding:**
  - Tortuous vessels
  - Distal external iliac artery
  - Long lesions

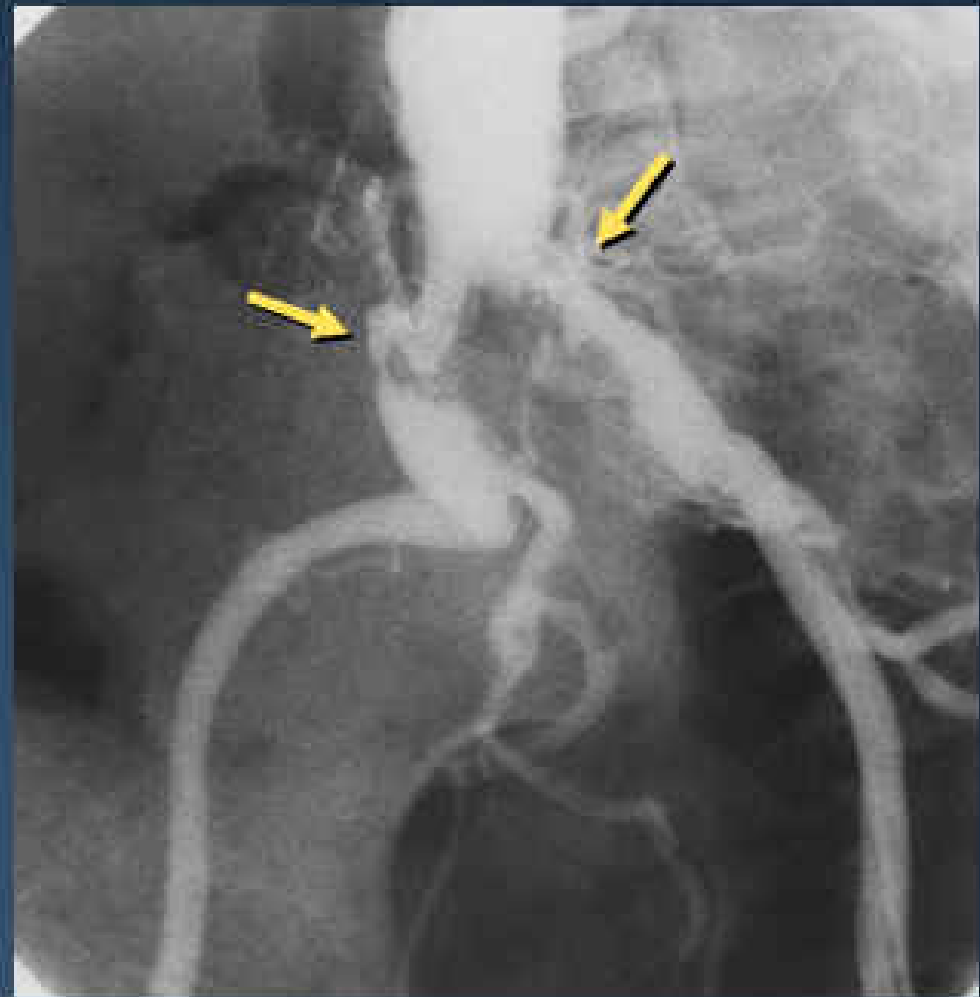
# Covered Stents



Atrium iCAST PTFE Covered BE Stent

# Case History

- Heavy calcification of distal aorta and proximal iliac arteries
- Complex, eccentric right common iliac stenosis
- Tortuous right iliac artery





# Balloon Expandable Iliac Stenting

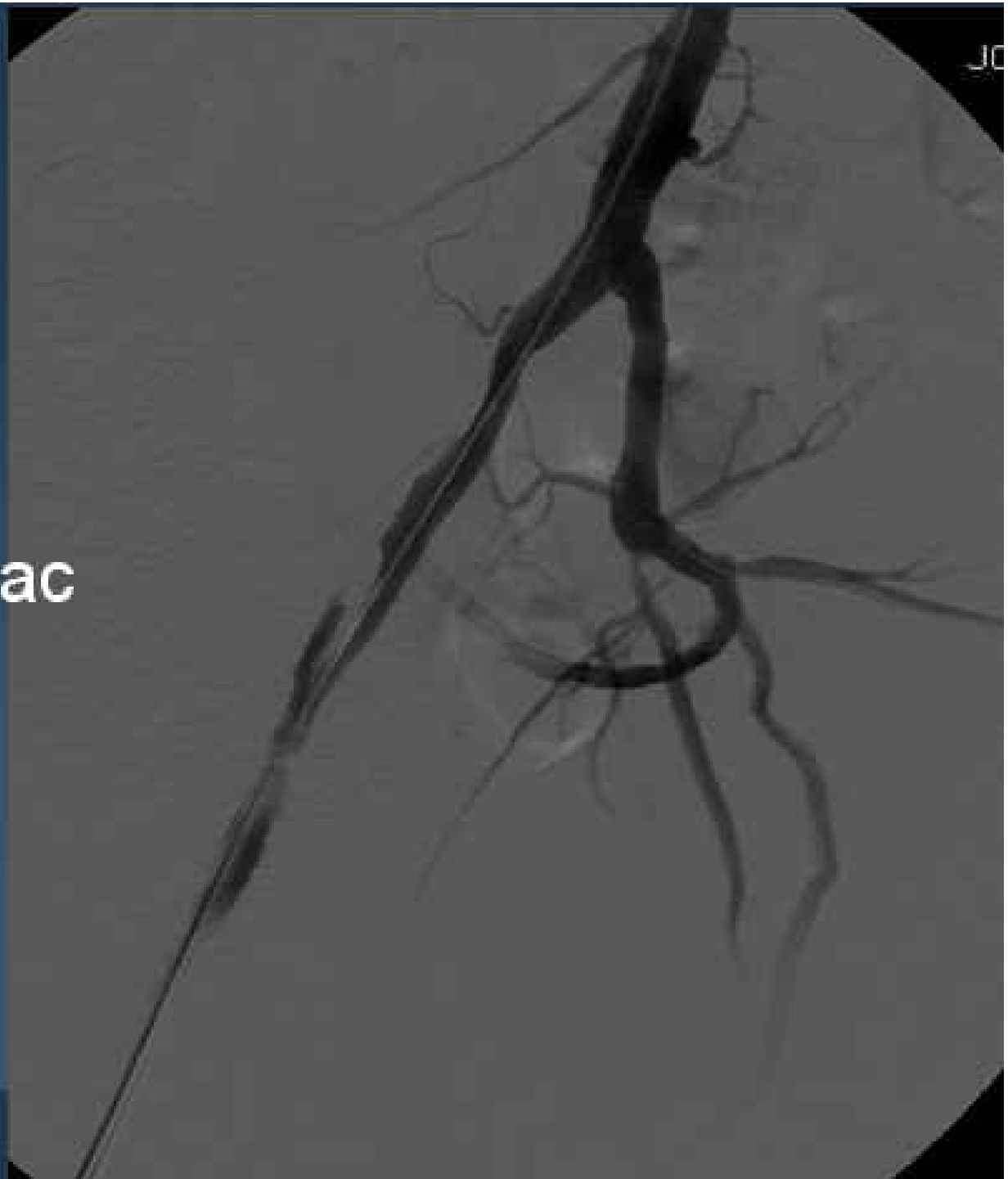


Baseline



Final Result

# Right external iliac artery disease



- Long self-expanding nitinol stent to cover diseased segment
- Post-dilated with appropriately sized balloon



# Final Result



# Bare stent



Courtesy of Samir Saher

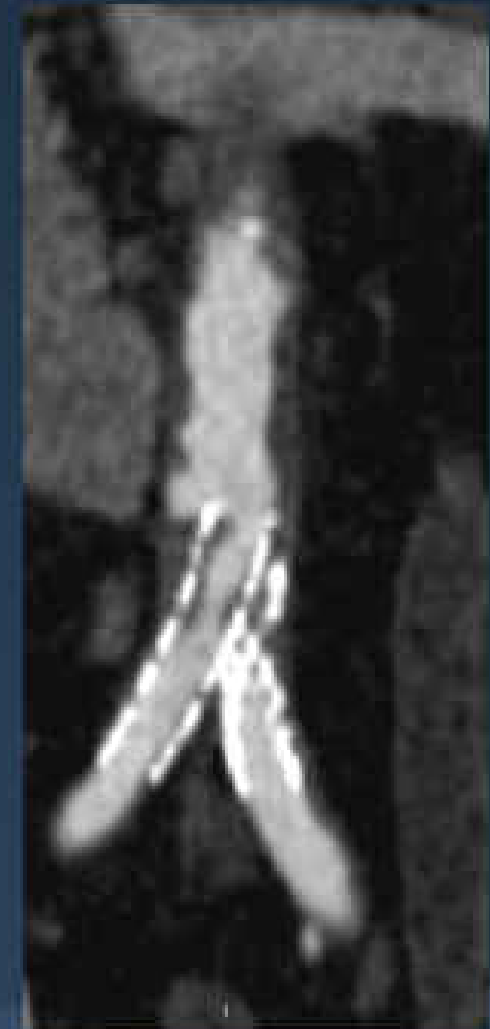
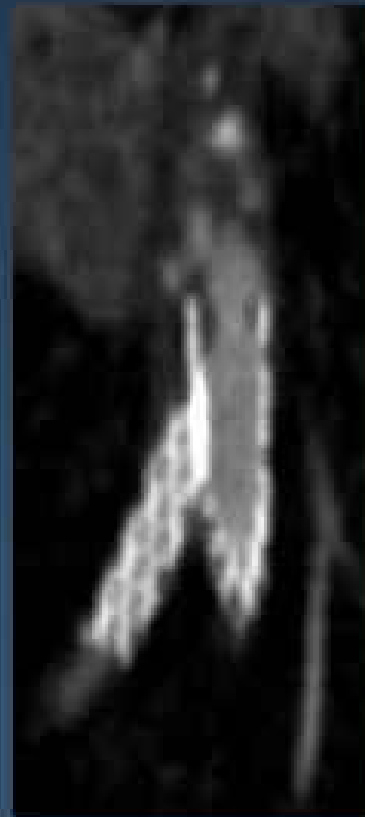


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CTA  
followup



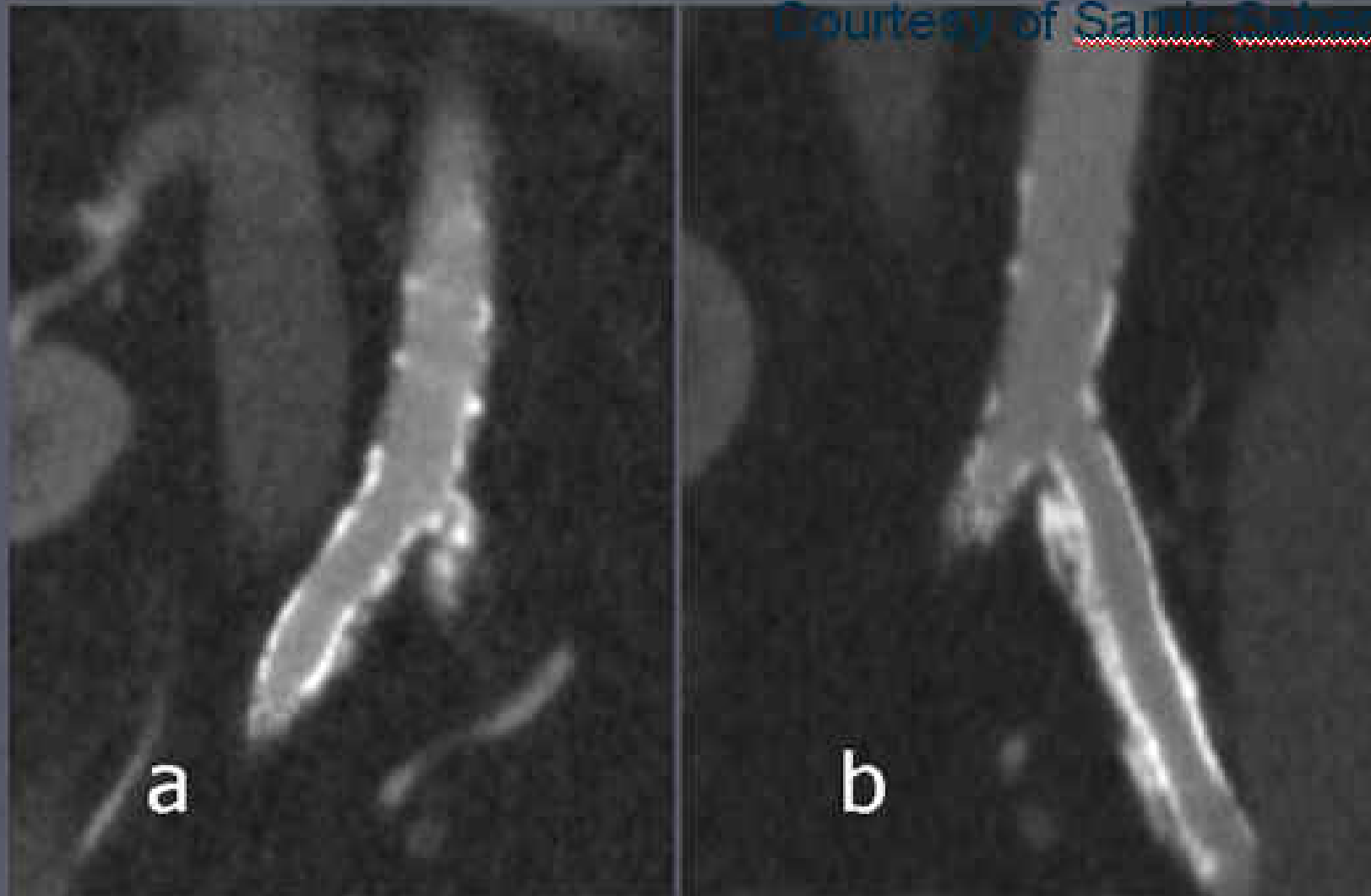
Intimal hyperplasia





63 year old female with bilateral claudications. Initial aortogram (a) showing bilateral common iliac stenoses , more advanced on the left successfully treated with kissing covered iliac stents (b)

Courtesy of [Samir Sabharwal](#)



Coronal MPR images of the right (a) and the left (b) common iliac arteries from a CTA at 24 months post procedure showing patency of the covered iliac stents and no intimal hyperplasia



# Approach to Chronic Iliac Occlusions

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# Technique

- Good quality DSA, MRA, or CT Angio to plan approach
- Be prepared to attempt antegrade and retrograde crossing of the occlusion
- Have available a full inventory of stents to treat the occlusion – complete lesion coverage
- Full inventory of bailout equipment

# Technique

- If there is a proximal stump – try from above (an arm approach may provide more support if contralateral approach fails)
- Kissing stents if there is disease at the ostium of the contralateral iliac artery
- If the onset of symptoms is acute or subacute – use thrombolytic therapy or mechanical thrombectomy
- New technologies if standard guidewires fail

# Iliac Occlusion

- 67 year old female
- Chronic right hip and calf claudication
- Absent right femoral pulse
- ABI = 0.6



# Technique

- Contralateral approach
- Crossover sheath – advance guidewire into internal iliac artery and exchange for stiffer wire to allow for sheath advancement
- Cross occlusion with straight Terumo wire
- Conservative balloon sizing

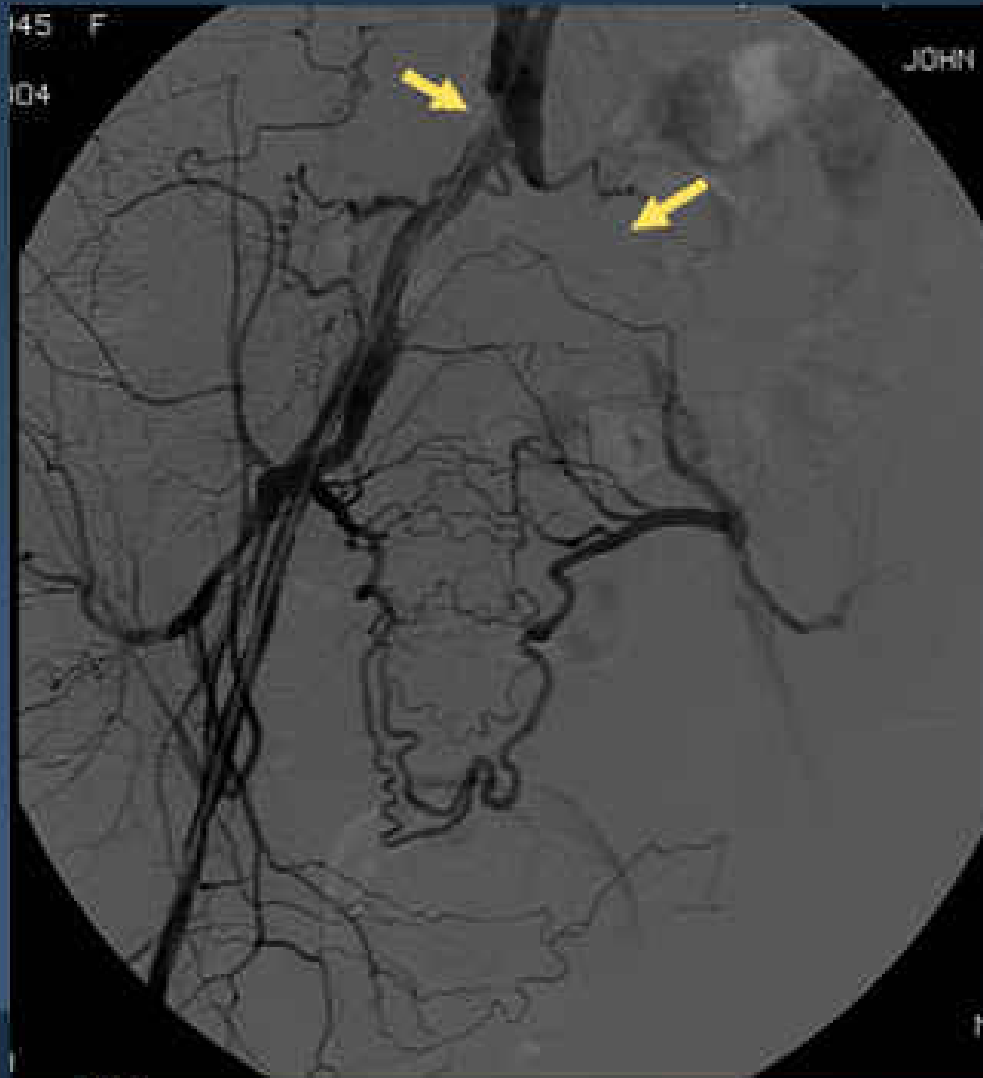


# Technique

- Complete coverage of the lesion
- Stent choice: self expanding Nitinol (SMART, 8 mm diameter, 80 mm long)
- Post dilatation with 7 mm balloon



# Iliac Occlusion



- Occlusion approached from above
- Simmons 1 catheter across bifurcation
- Lesion crossed with angled hydrophilic guidewire

# Technique



Guidewire steered into sheath  
And externalized



Balloon advanced from left side  
And PTA performed



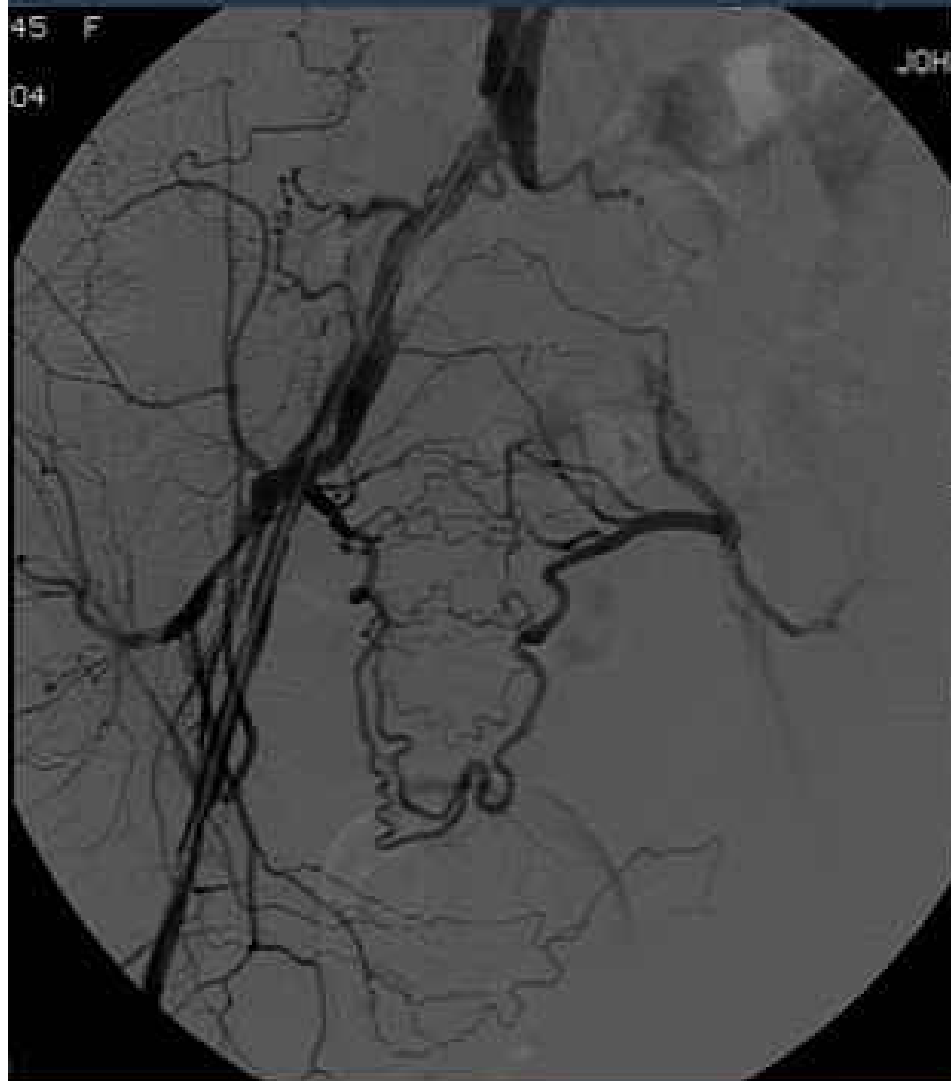


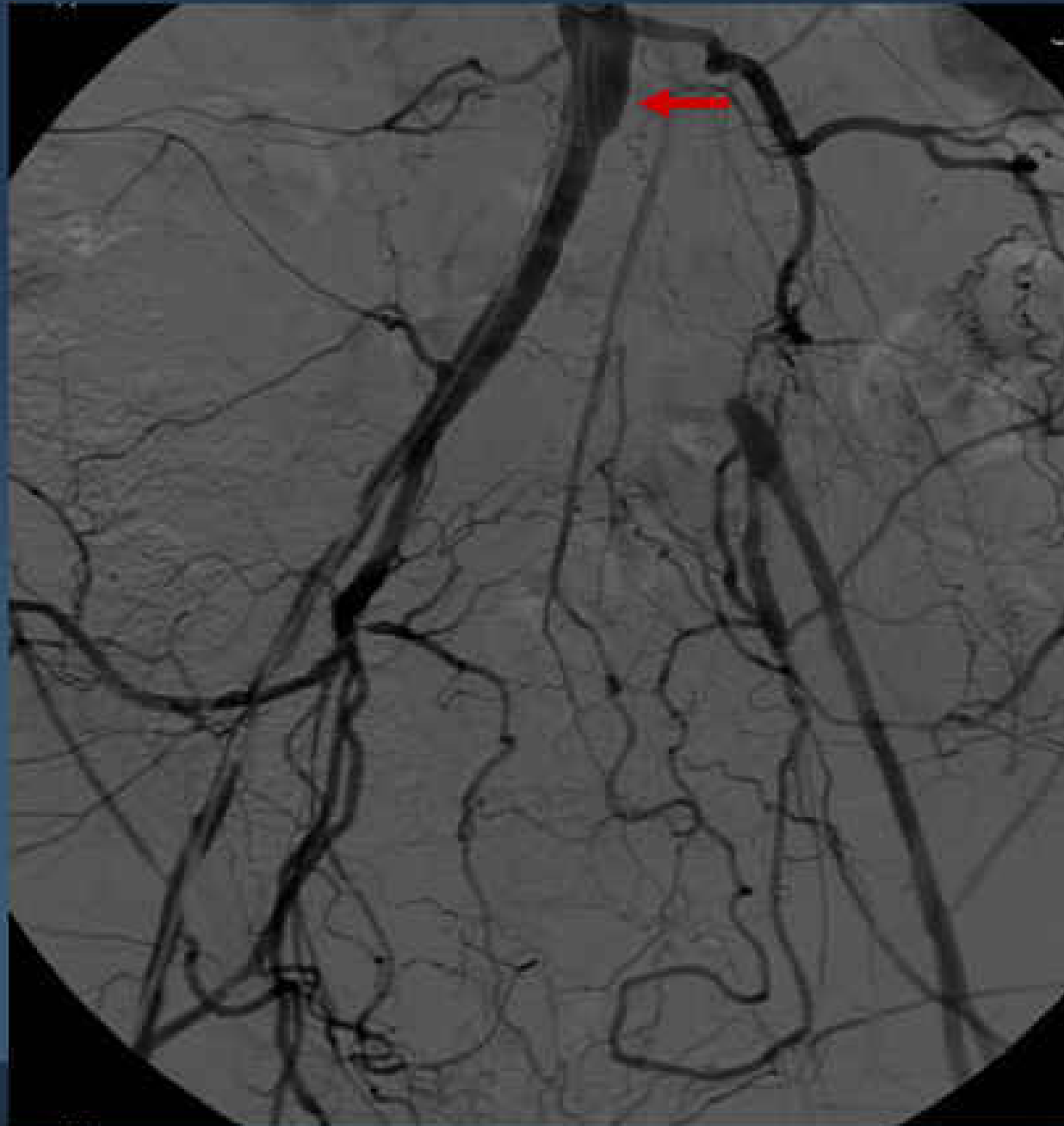
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04

JOHN

- **복합**

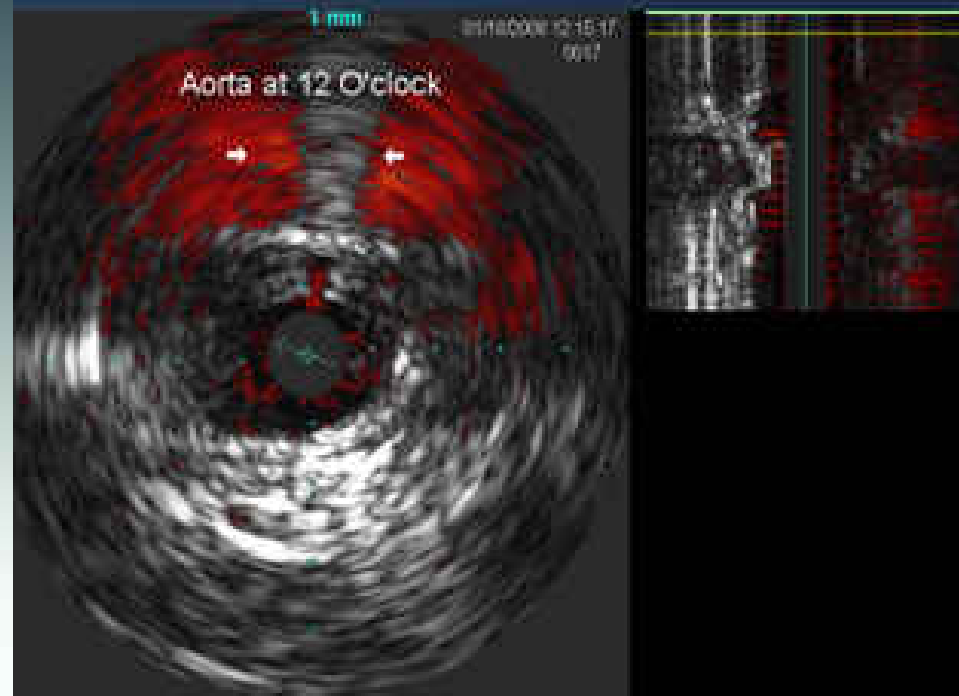
**Kissing balloon expandable stents deployed**



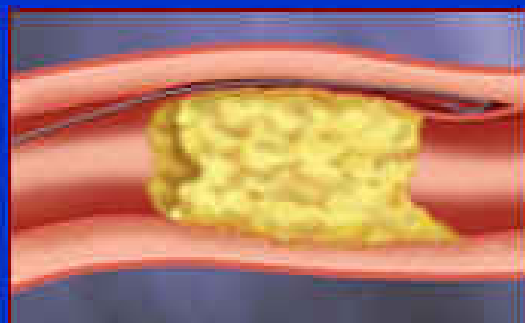


If subintimal,  
where do I  
pop back  
into the true  
lumen?

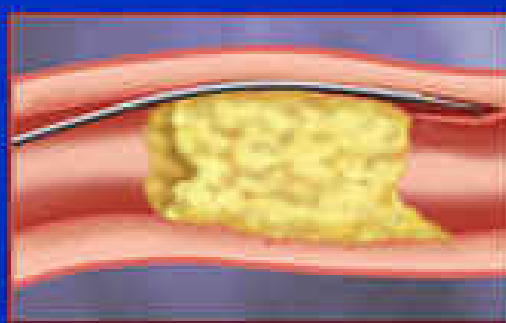
# Pioneer Catheter



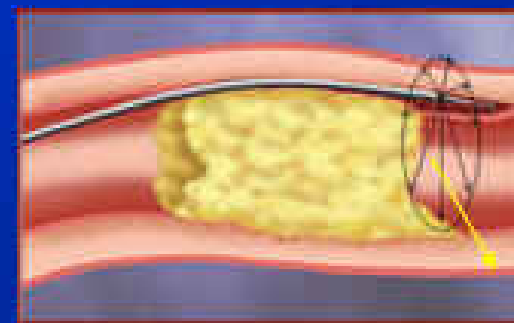
# Reentry Devices



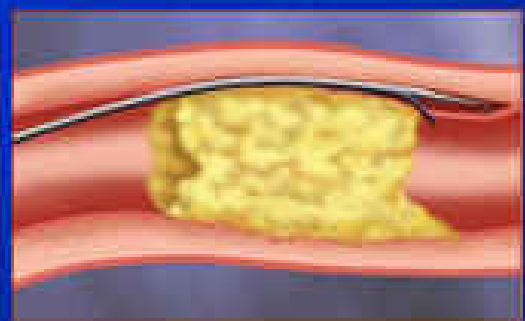
Step 1: Guidewire entrapment



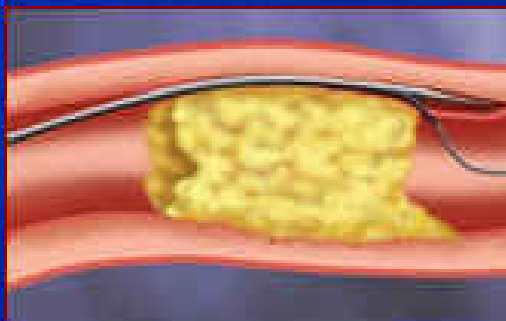
Step 2: Catheter insertion



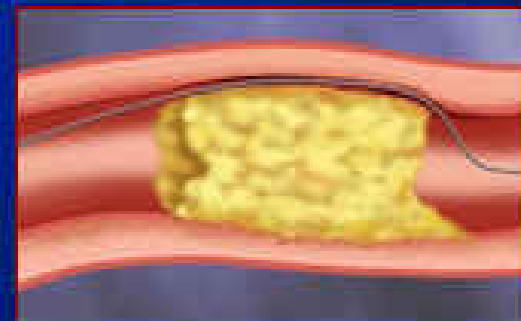
Step 3: Catheter rotation



Step 4: Deploy needle



Step 5: Pass guidewire to true lumen



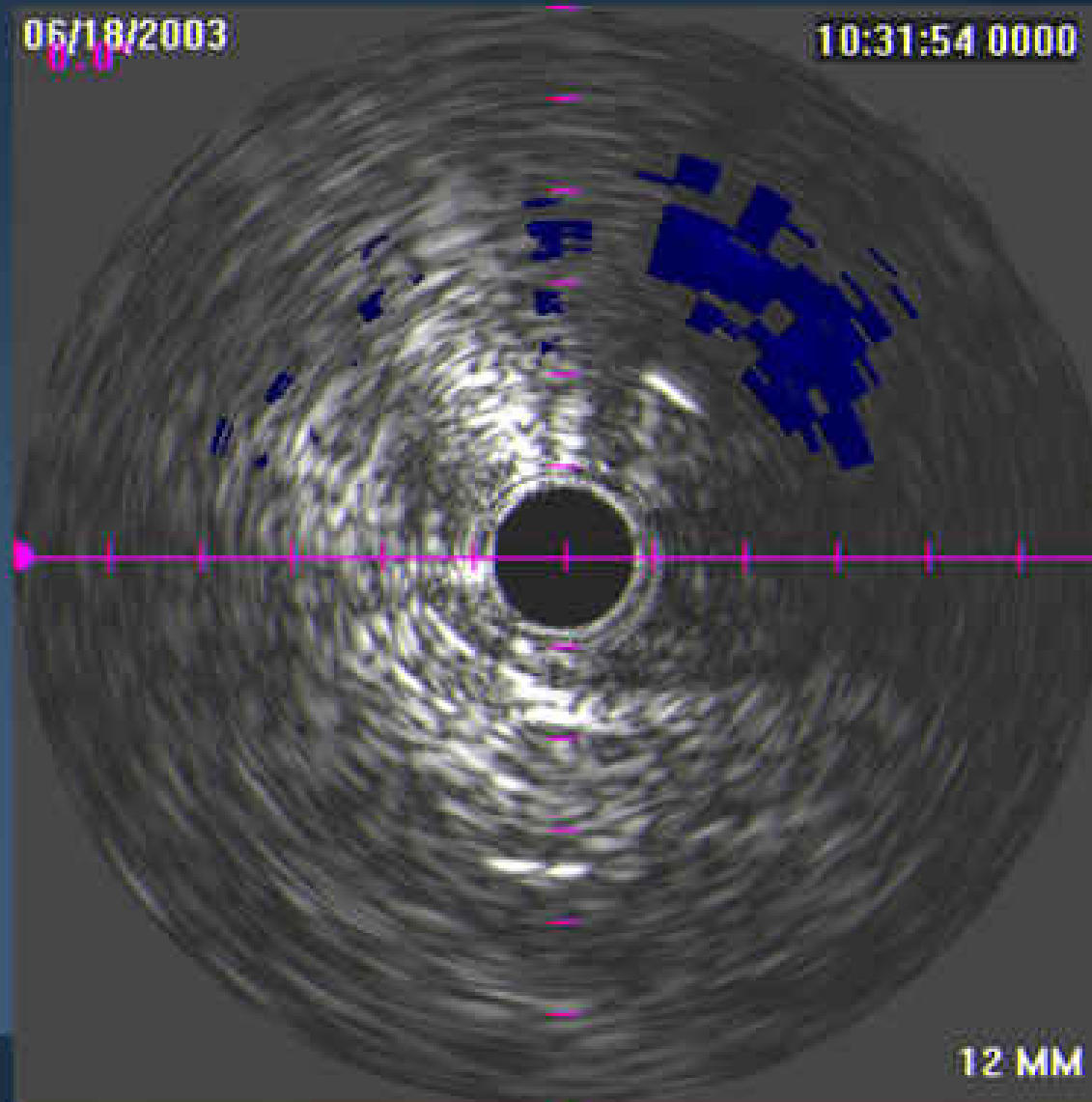
Step 6: Remove catheter

# Pioneer Reentry

06/18/2003

0.0

10:31:54 0000



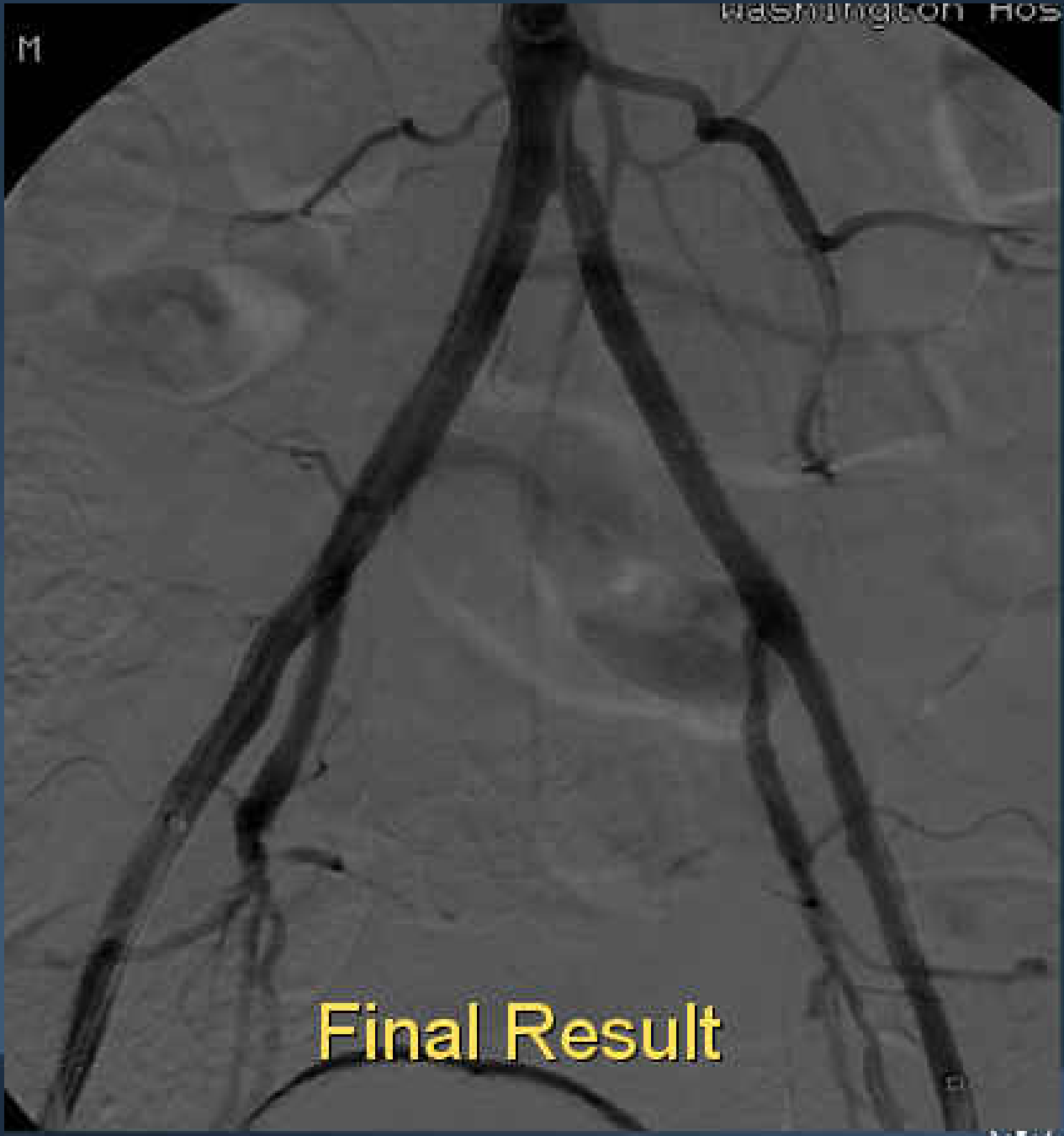
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Final Result

