How to cope with difficulties and complications following EVAR with separated stent graft

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WHY SEPARATED STENT GRAFTS?

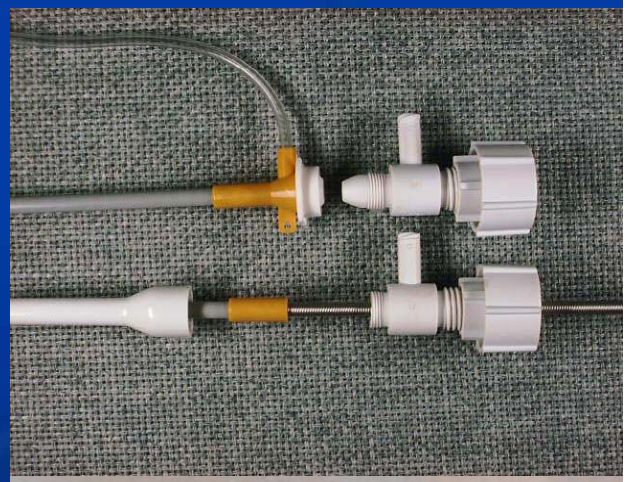
Current stent-grafts has some limitations :

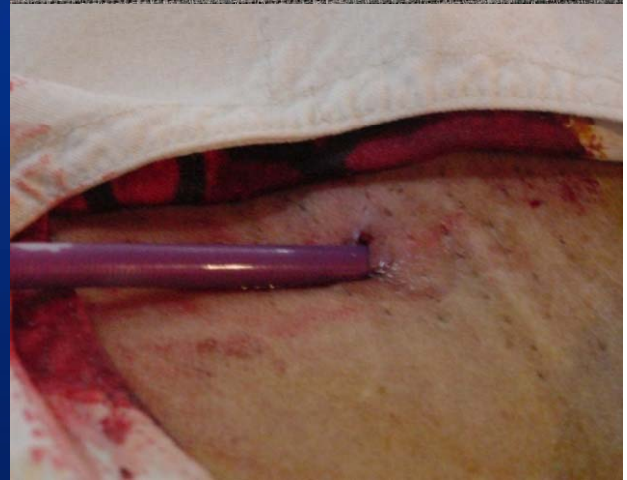
- Restrict the range of suitable anatomy (big delivery system vs relatively small vessel)
- Difficult to pass/negotiate w/ iliac tortousity
- Vessel dissection/rupture(trauma)
- Need surgical exposure (arteriotomy)
- General anesthesia

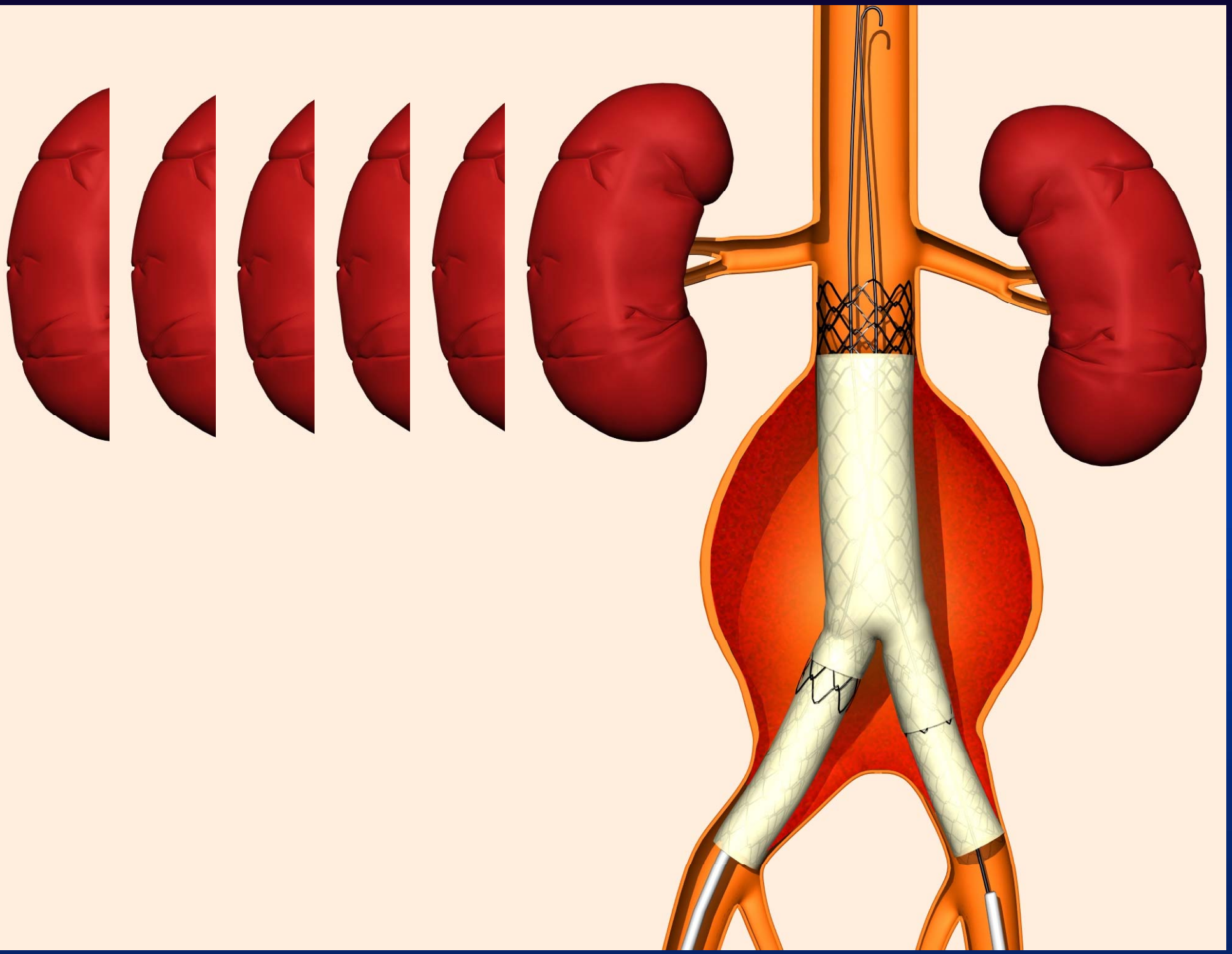
So.....reduce profile is a desirable goal!!!

SMALL PROFILE DELIVERY SYSTEM

- Easier to introduce
- Negotiable to vessel tortousity (iliacs)
- Less likely to arterial trauma
- No need surgical exposure (arteriotomi)
- No need general anesthesia
- Success rate? Complication rate?



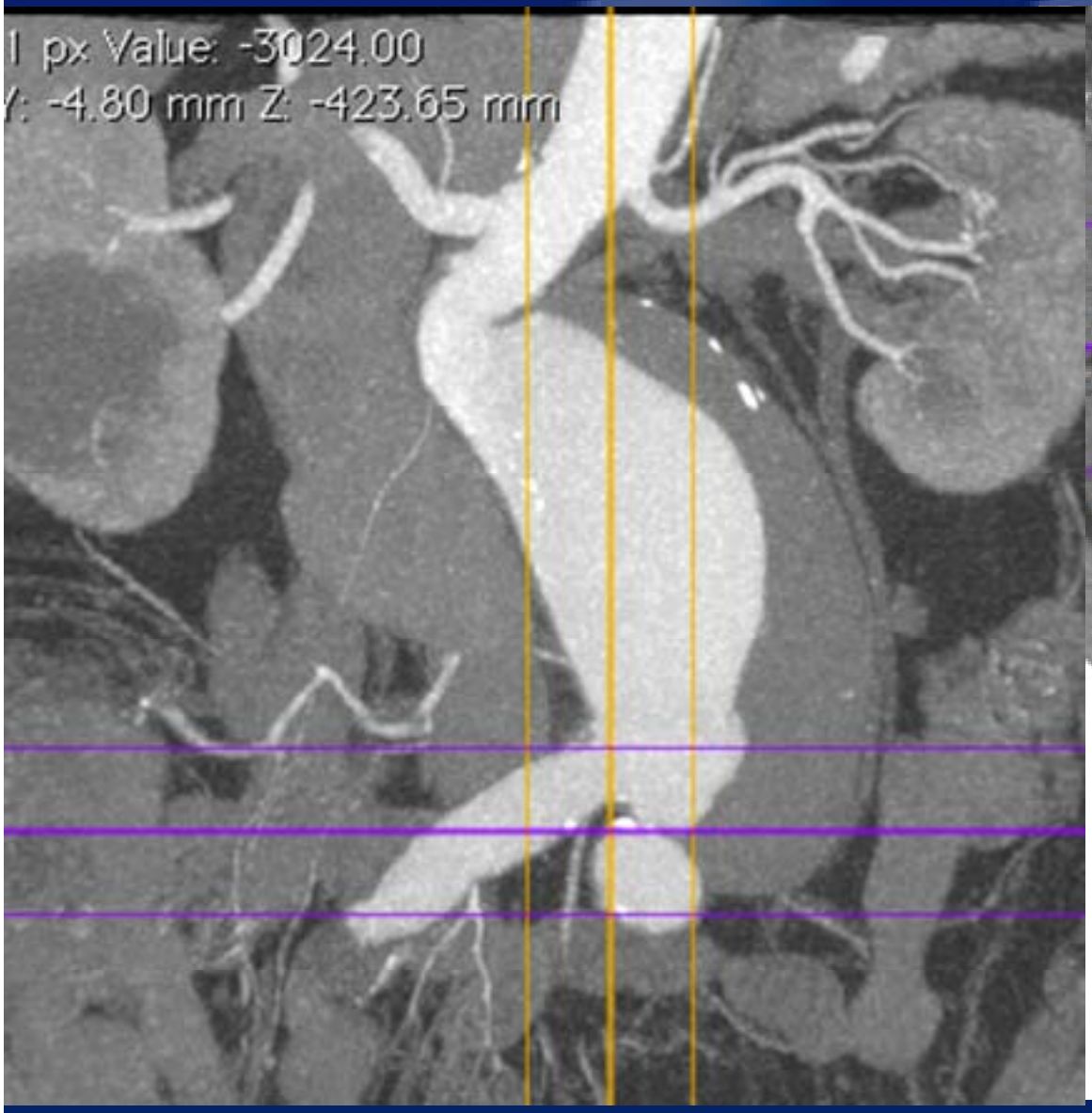


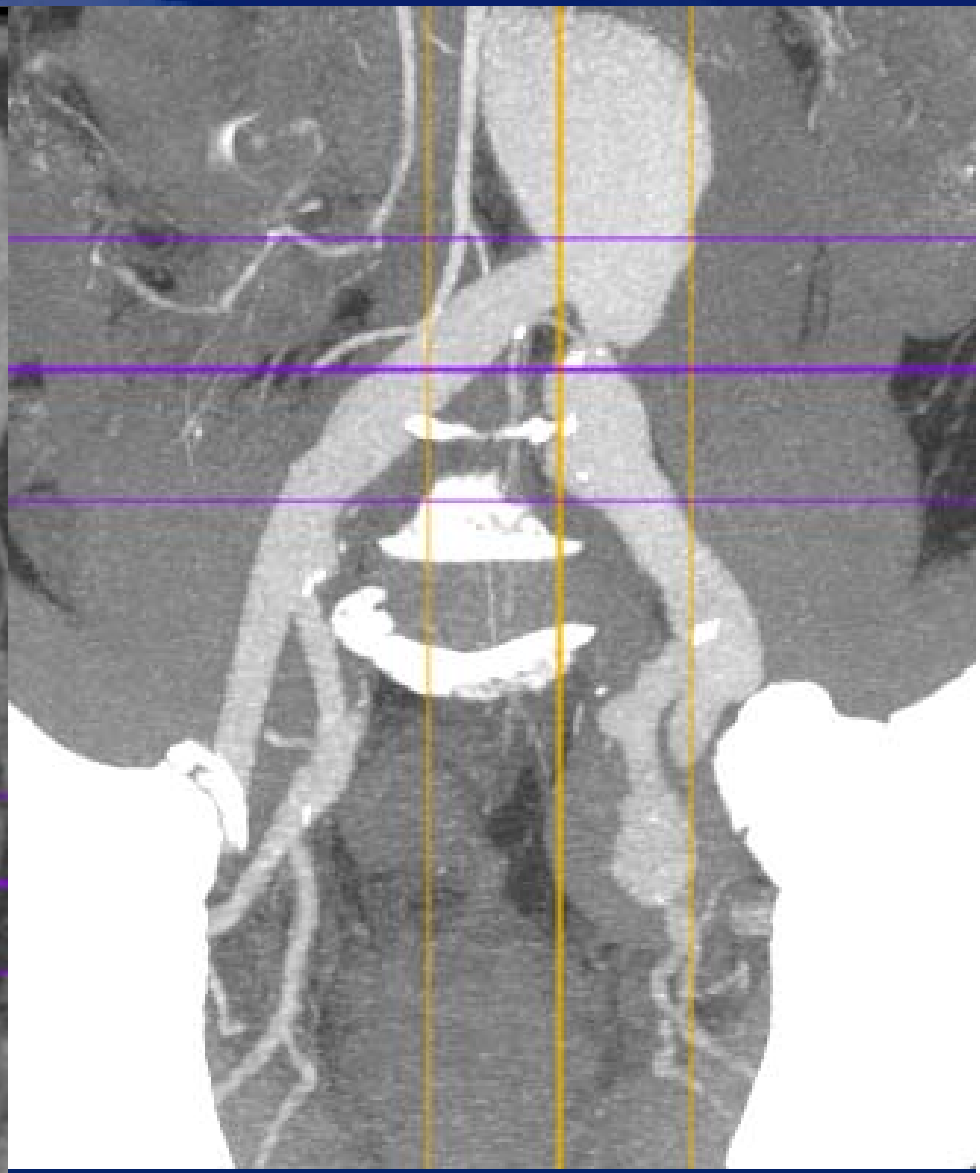


Mr. DS, 56

- Hypertension, Diabetes
- CAD post PCI (2 DES) 2011
- CKD Creatinine 1.5 (CCT 56), bilateral renal Cyst
- Abdominal Discomfort
- AAA visualized during US

CT Angiography

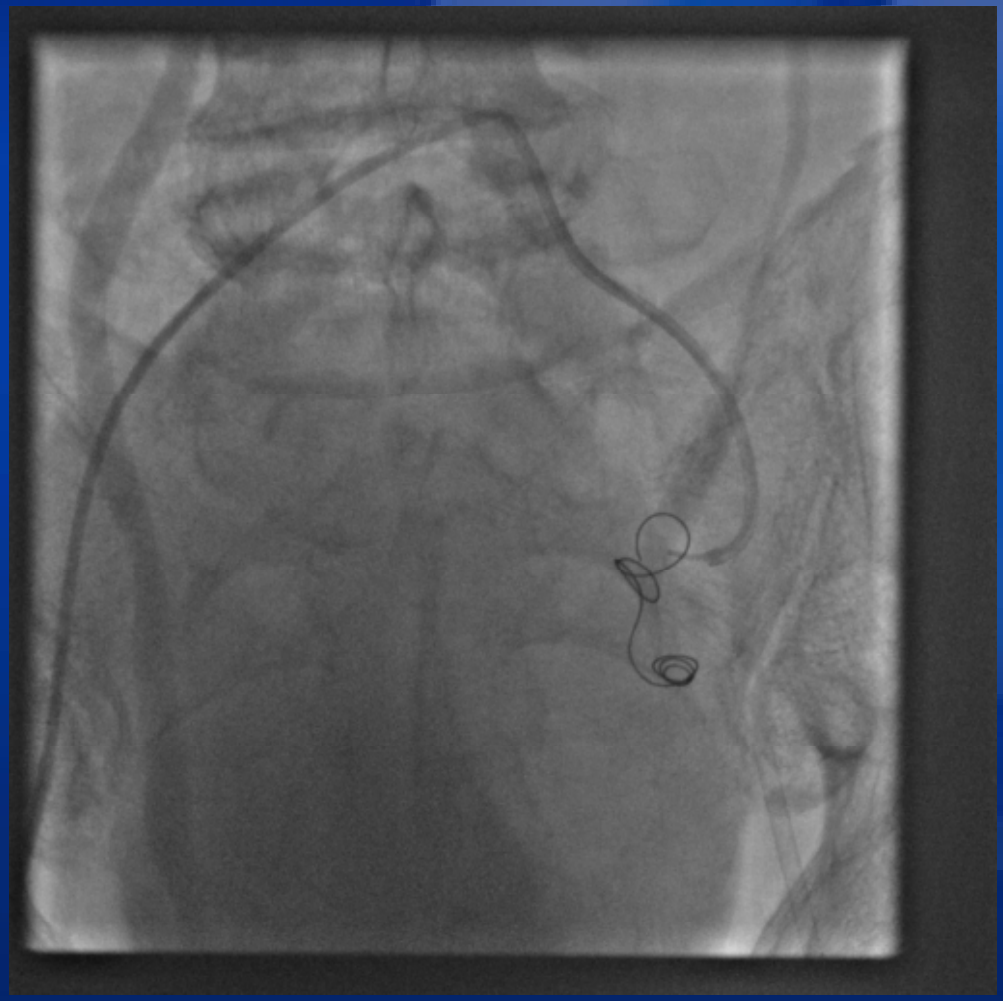


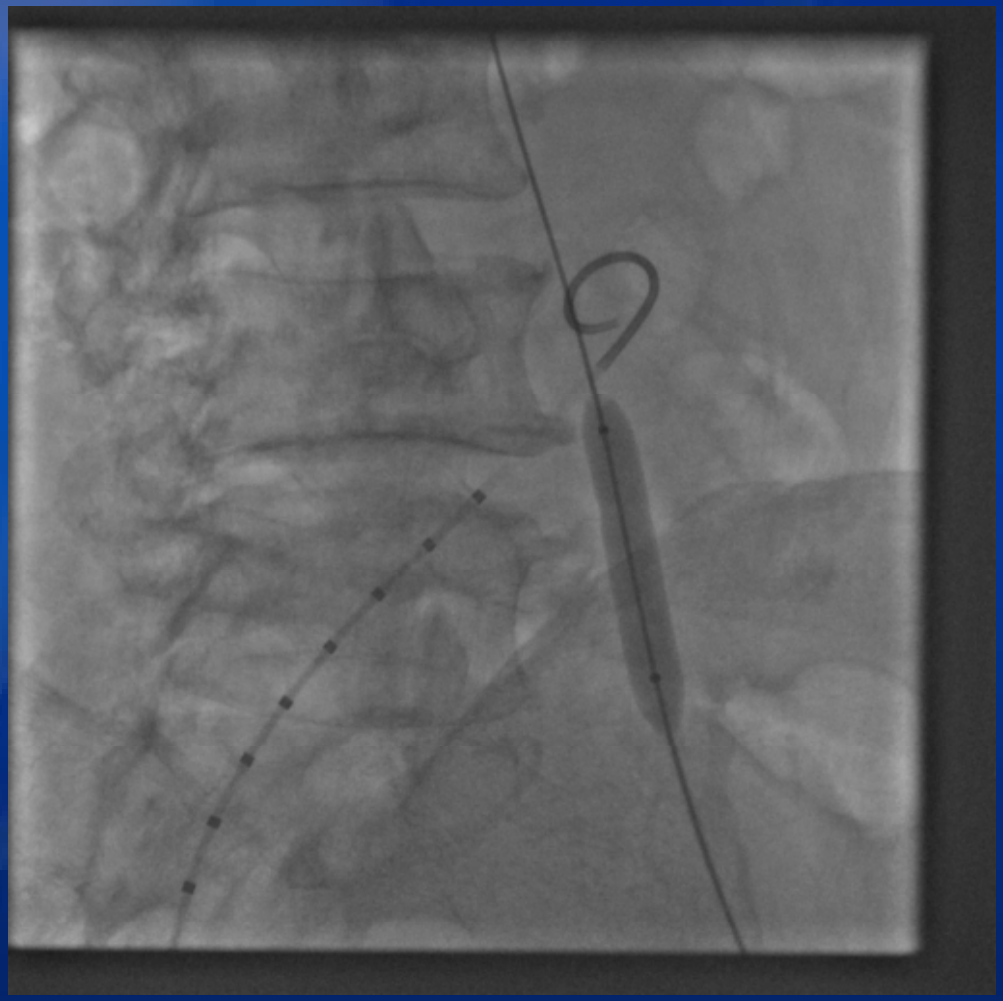


Initial Strategy

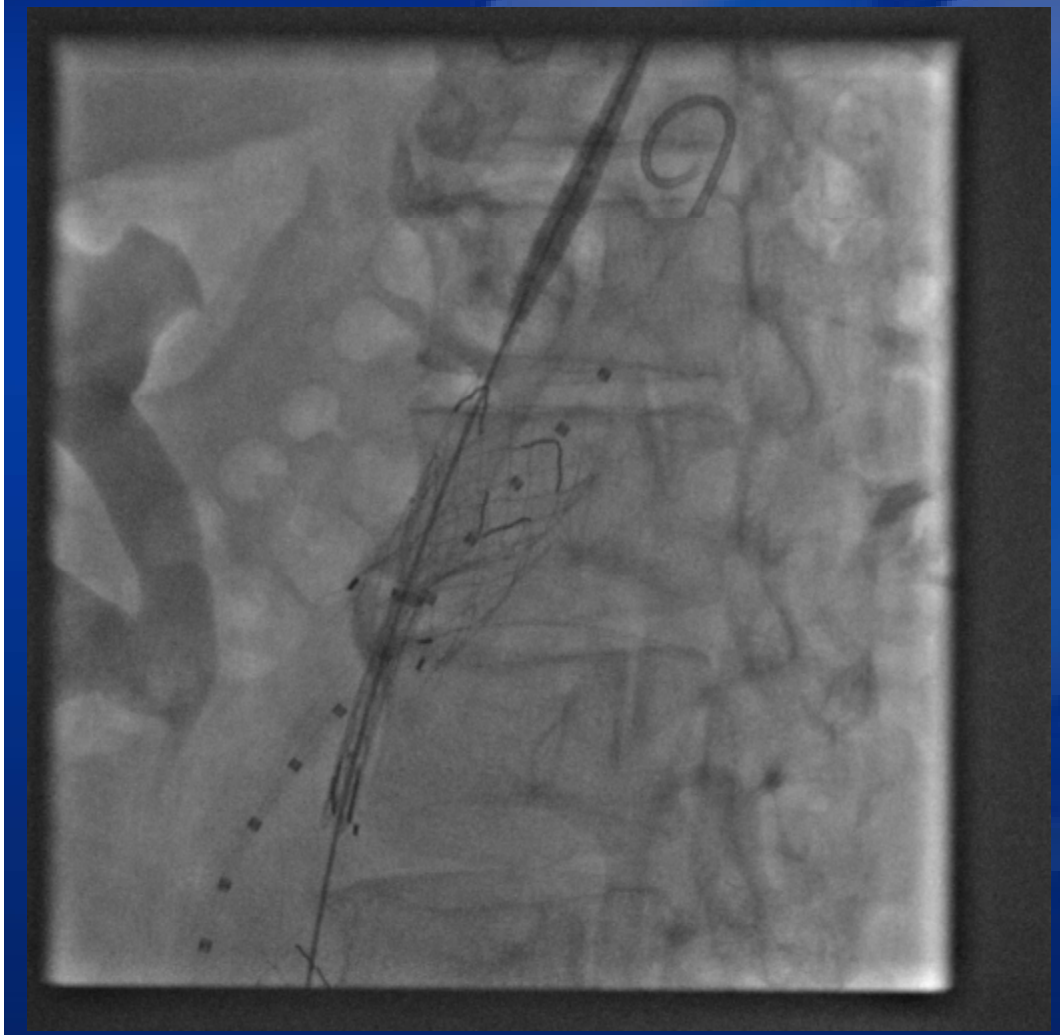
1. Coiling Left internal Iliac Artery
2. Balloon Angioplasty of Left Common Iliac Artery
3. Deploy the Main Body
4. Deploy Inner Bare stent of the Main Body
5. Deploy Right Extension Limb
6. Canulate Left limb of the main body and deploy left extension limb covering external iliac artery

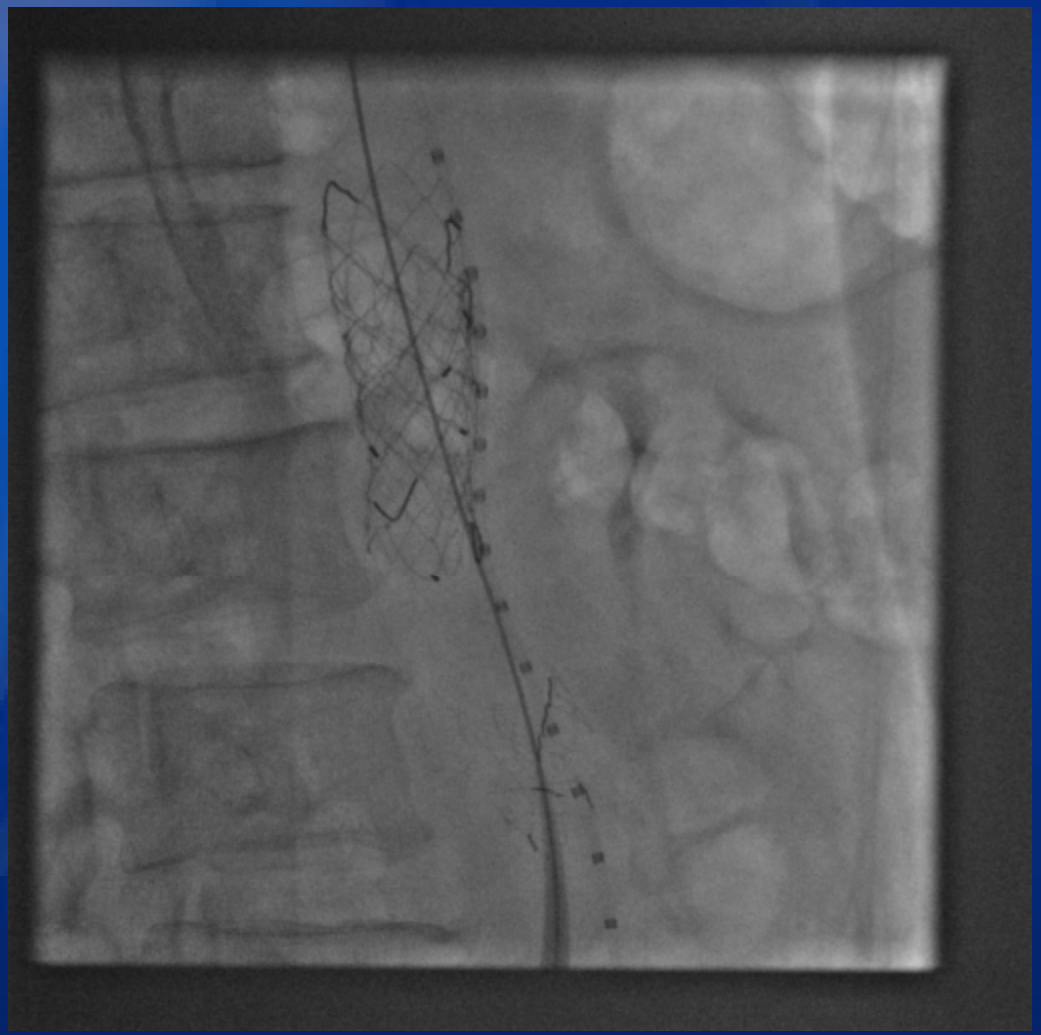
Coiling and PTA





Main Body





The Problems Started……

Unsupported graft:

1. Difficult to advance the right extension limb
2. Twisted: antero-posterior position
3. Very difficult to canulate the left limb

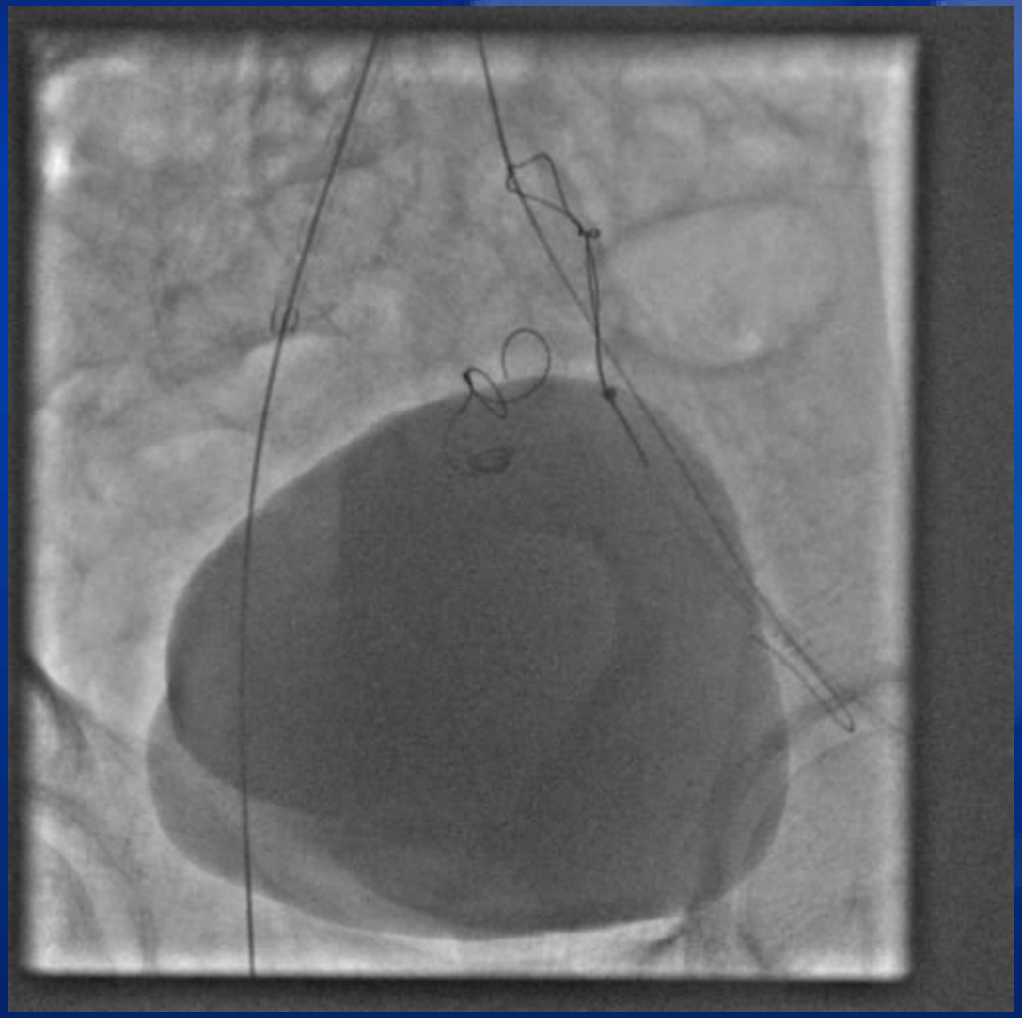
What to do?

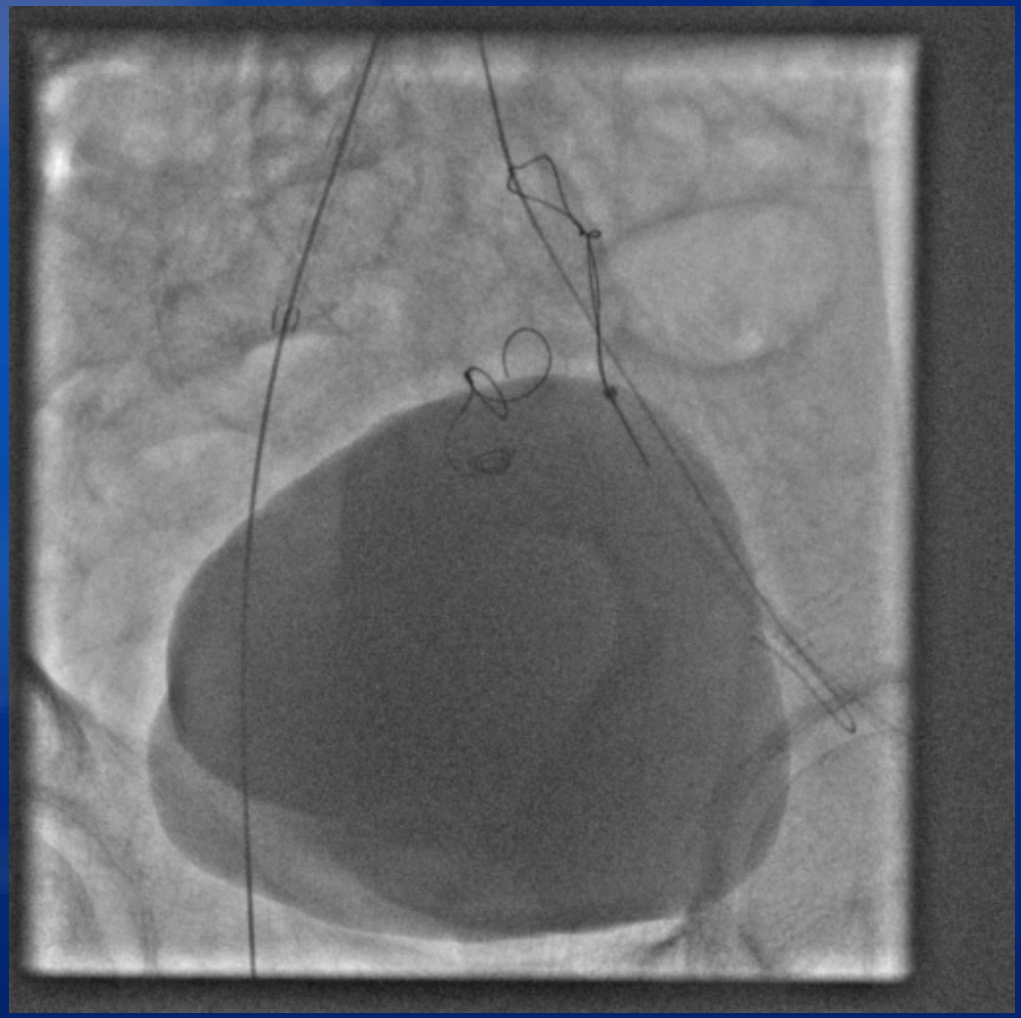
- Convert to open surgery
- Convert to Aorto-Uni-iliac and continue with femoro-femoral bypass
- Keep trying……

What we did

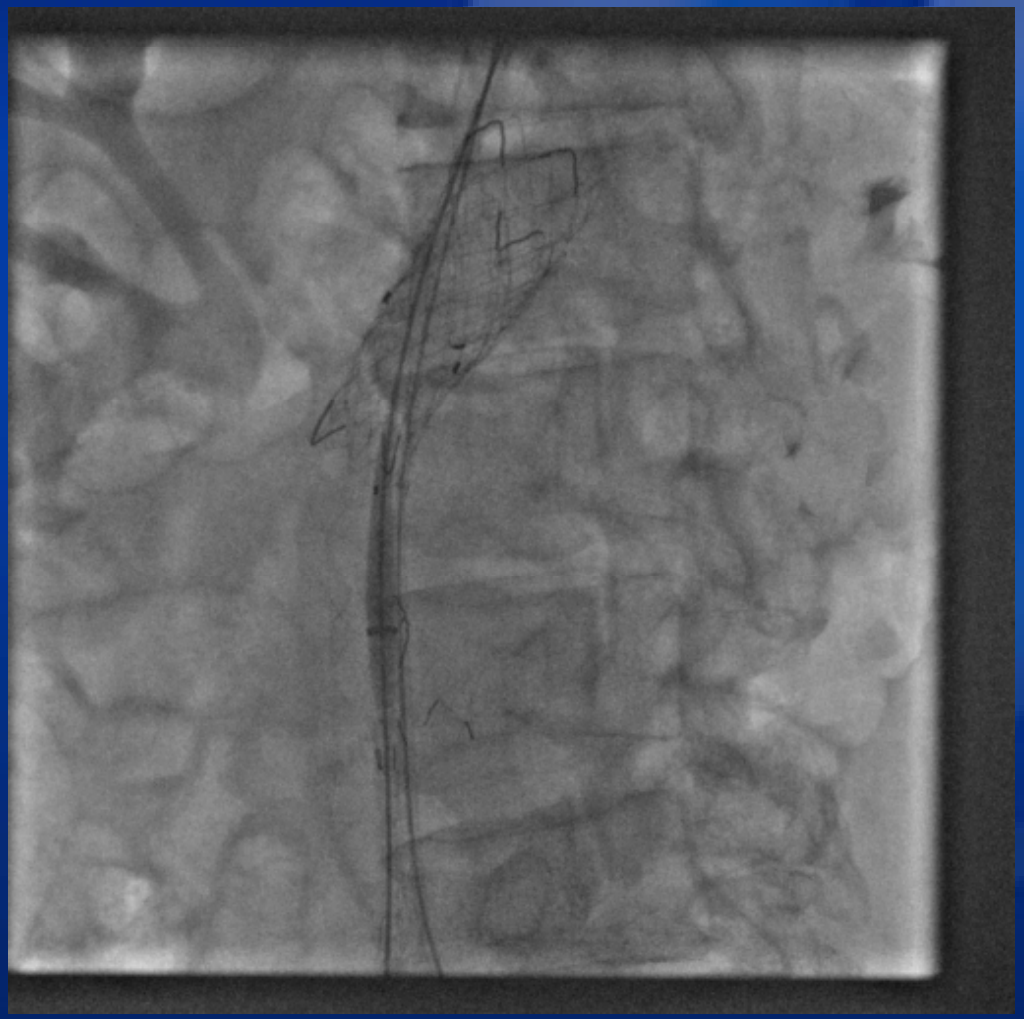
1. Difficult to advance the right extension limb
   - Balloon the right limb
   - Delay deploying until the left extension limb in position
2. Twisted: antero-posterior position
3. Very difficult to canulate the left limb
   - Wire the left limb through brachial access and snare from left femoral artery

Snaring





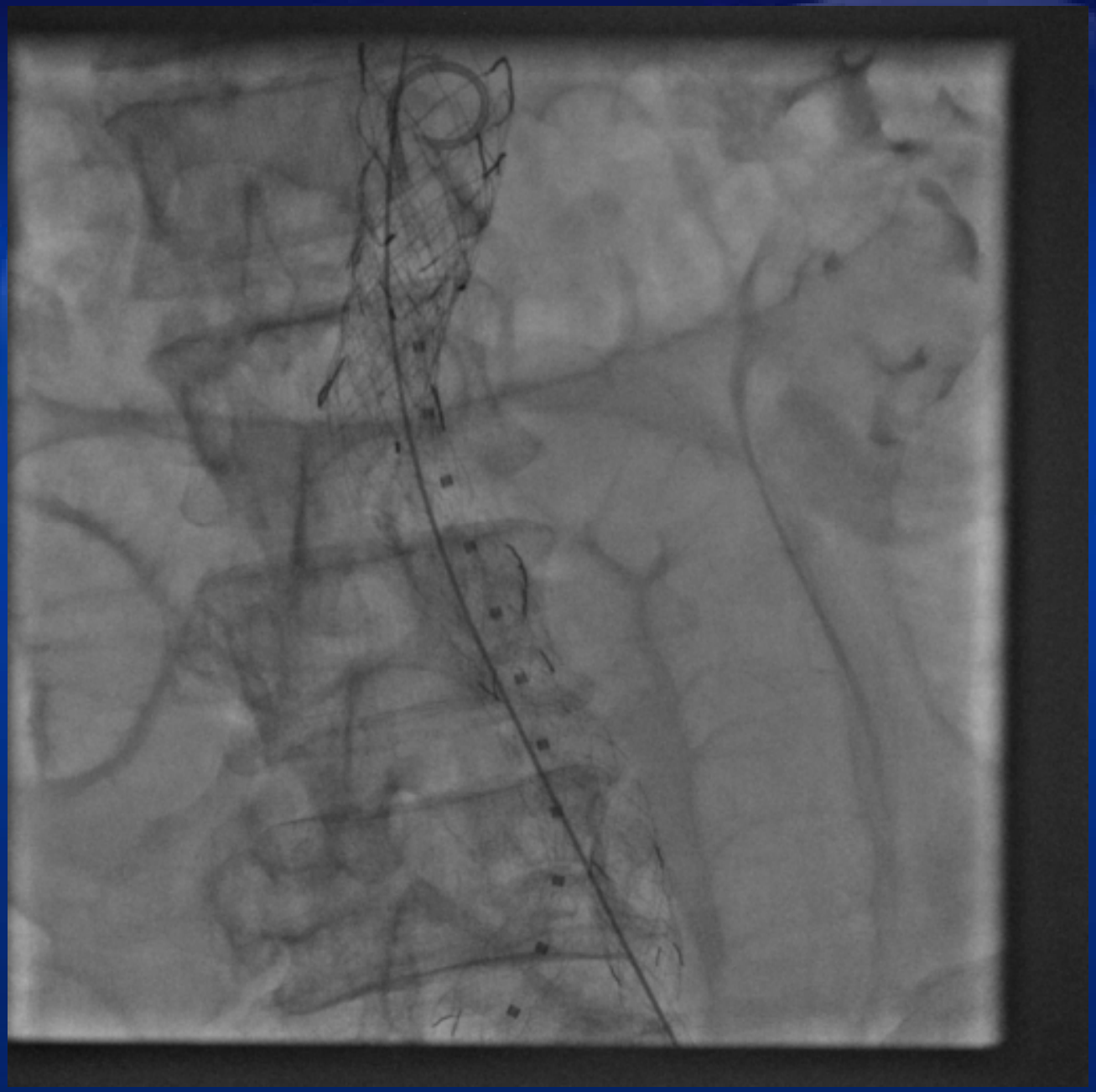
Even Catheter can not be advanced



What we did:

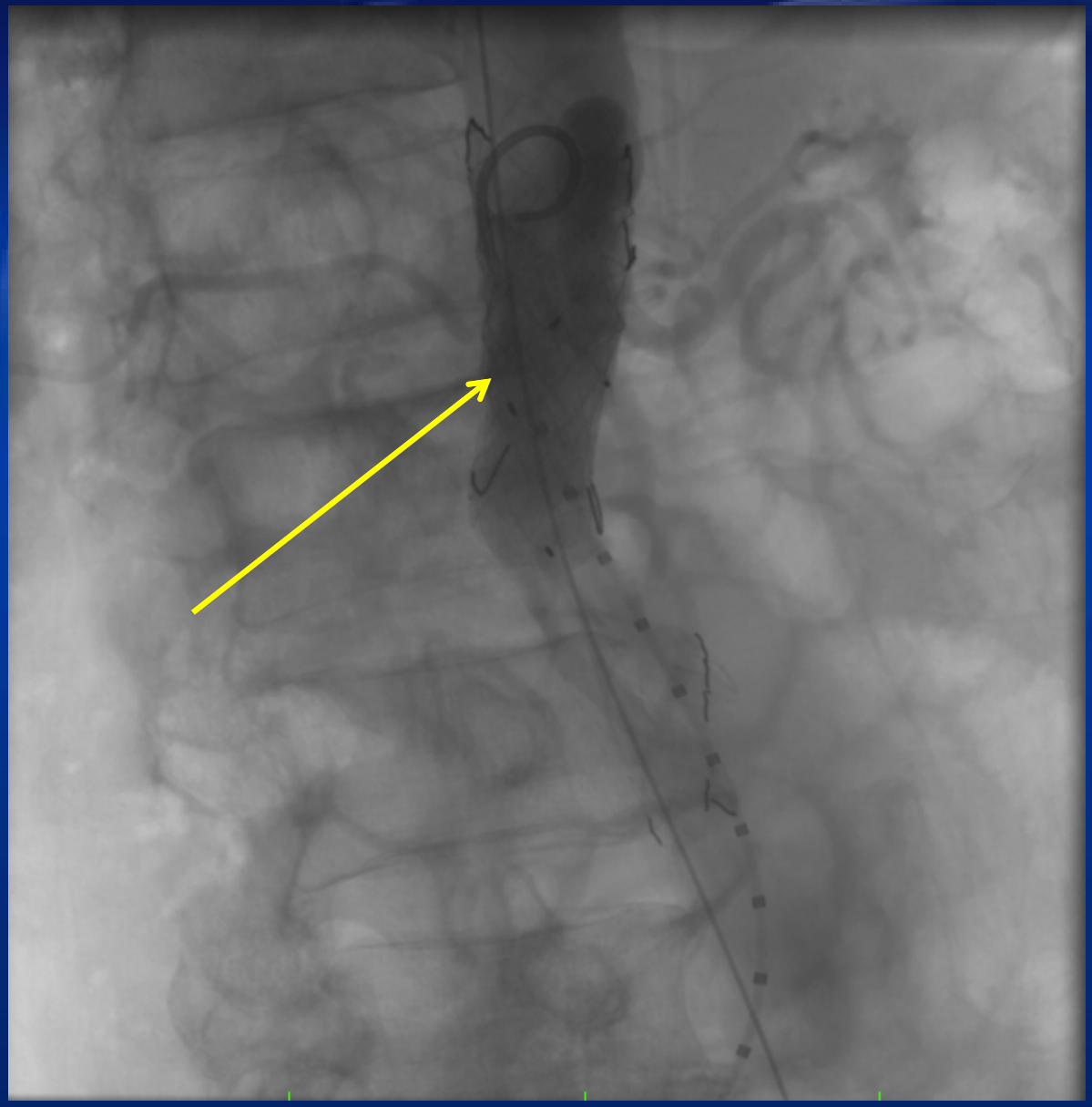
- Pull down right extension limb
- Balloon the left limb
- Advance catheter and left extension limb

Finally

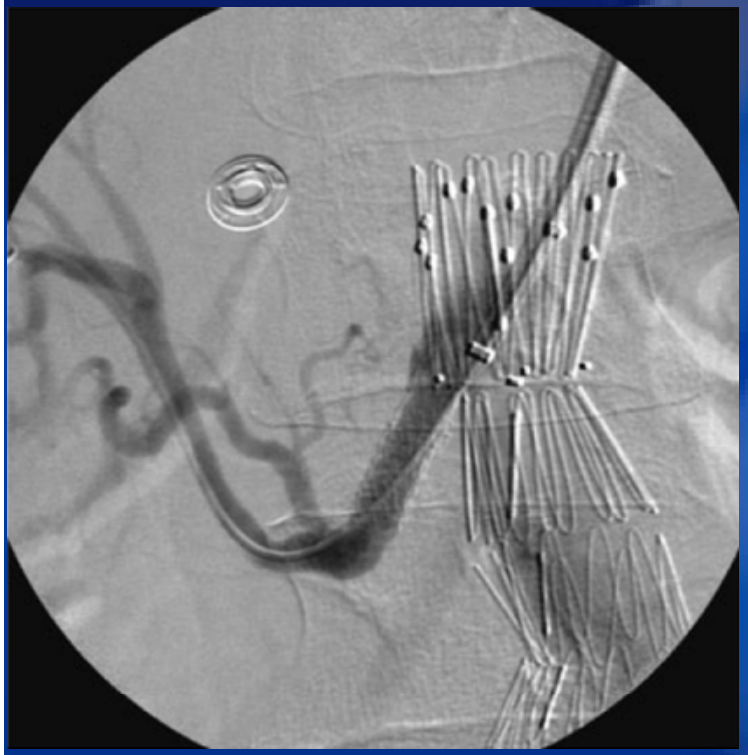


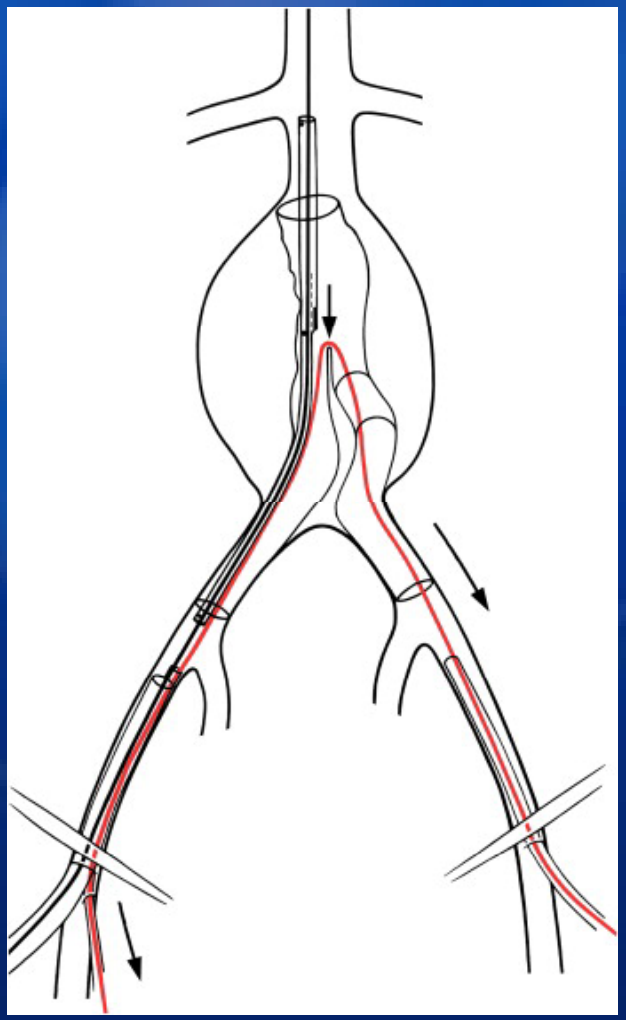
Stiff wire straighten the aorta and change the position of renal arteries

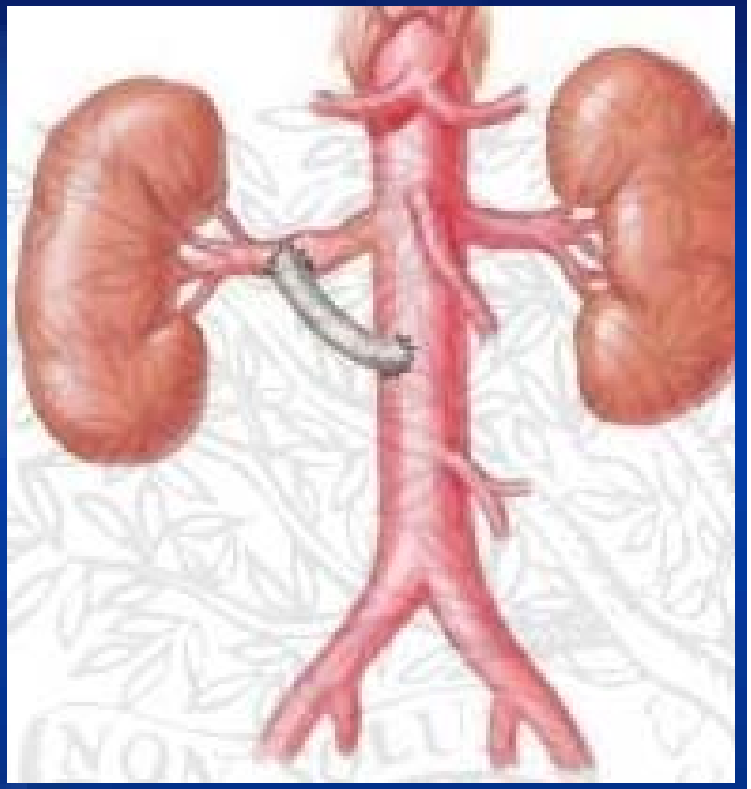
Partial occlusion of right renal artery



What to do?







What to do?

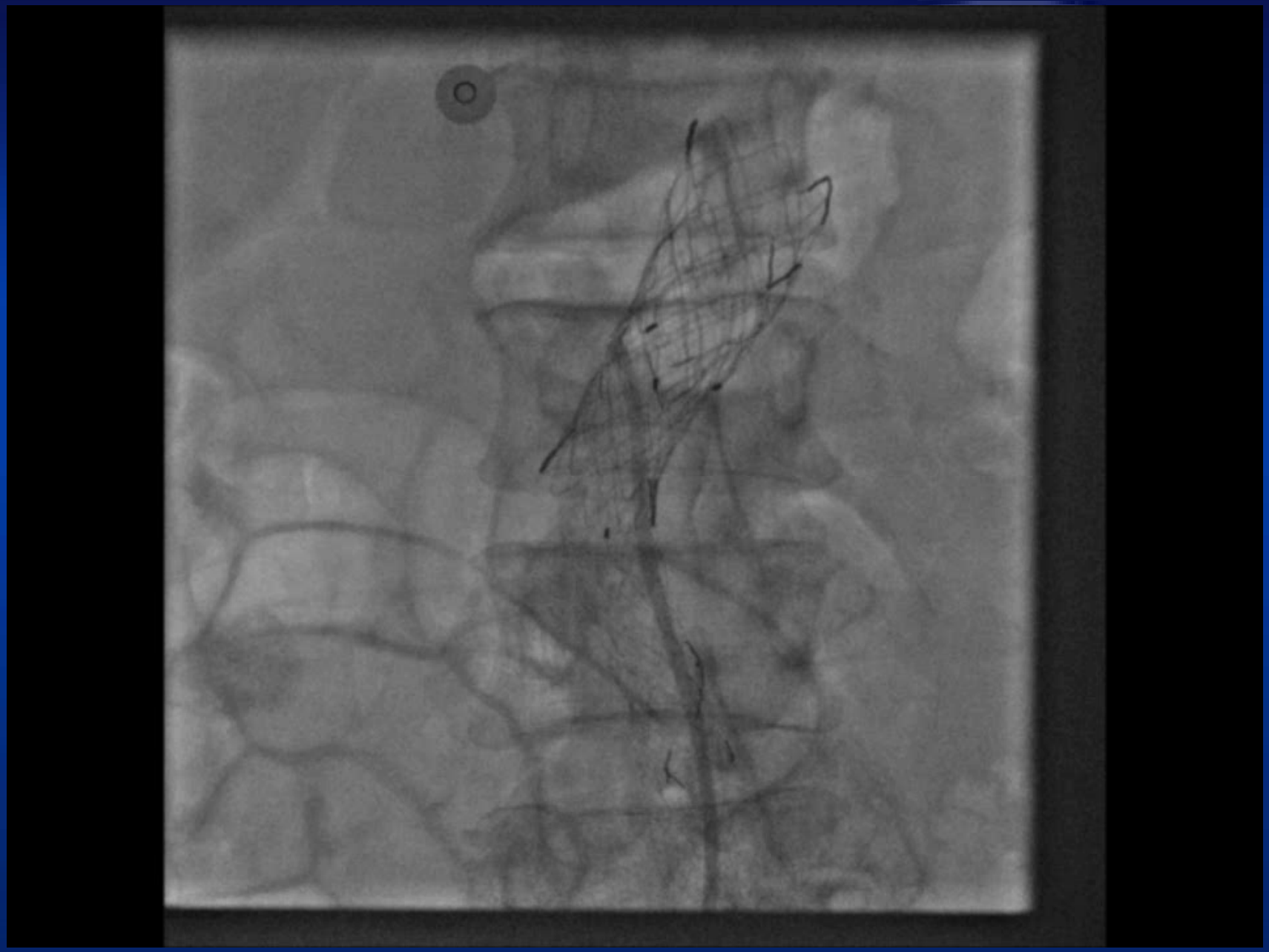
Consider:

- Procedure time: 8 hours!!!
- Contrast used: 700 cc !!!

Clinical Condition

- Urine output progressively decreased
- Pulmonary edema
- Cr level reached 9.7
- Hemodyalysis

Renal PTA



After Procedure

- Urine output progressively increased (2000cc/day)
- No dyspnoe
- Cr level decreased to 2.4
- No Hemodialysis

Lessons learned

- Separated stent graft with smaller profile can be used to treat AAA, however the extra precaution should be taken when dealing with unsupported graft
- Revascularization of occluded renal artery should be performed to avoid devastating renal failure

What to do?

- Pull down the whole system
- Revascularize renal artery percuateously
- Aorto-renal bypass
- Observe clinically

- Consider:
  - Procedure time: 8 hours!!!
  - Contrast used: 700 cc !!!