

Techniques and Complications of EndoVascular Aortic Repair

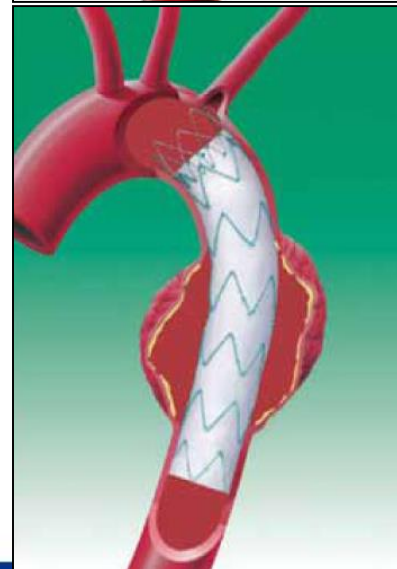
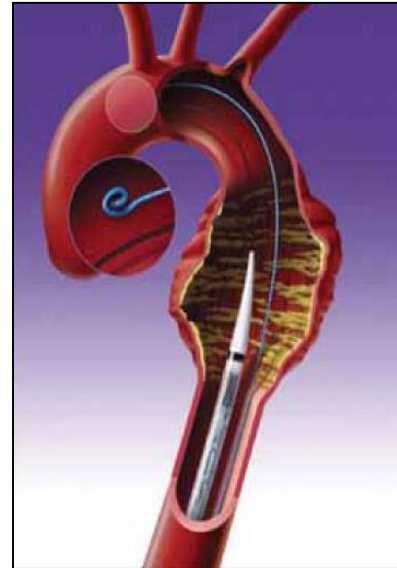
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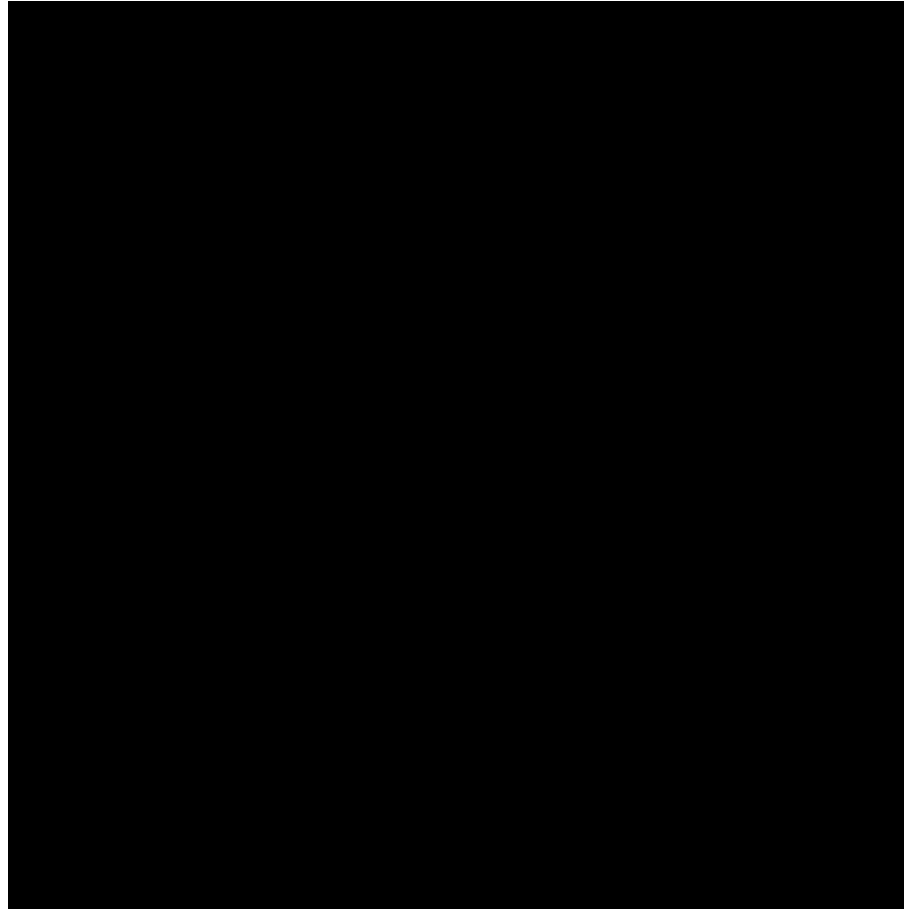
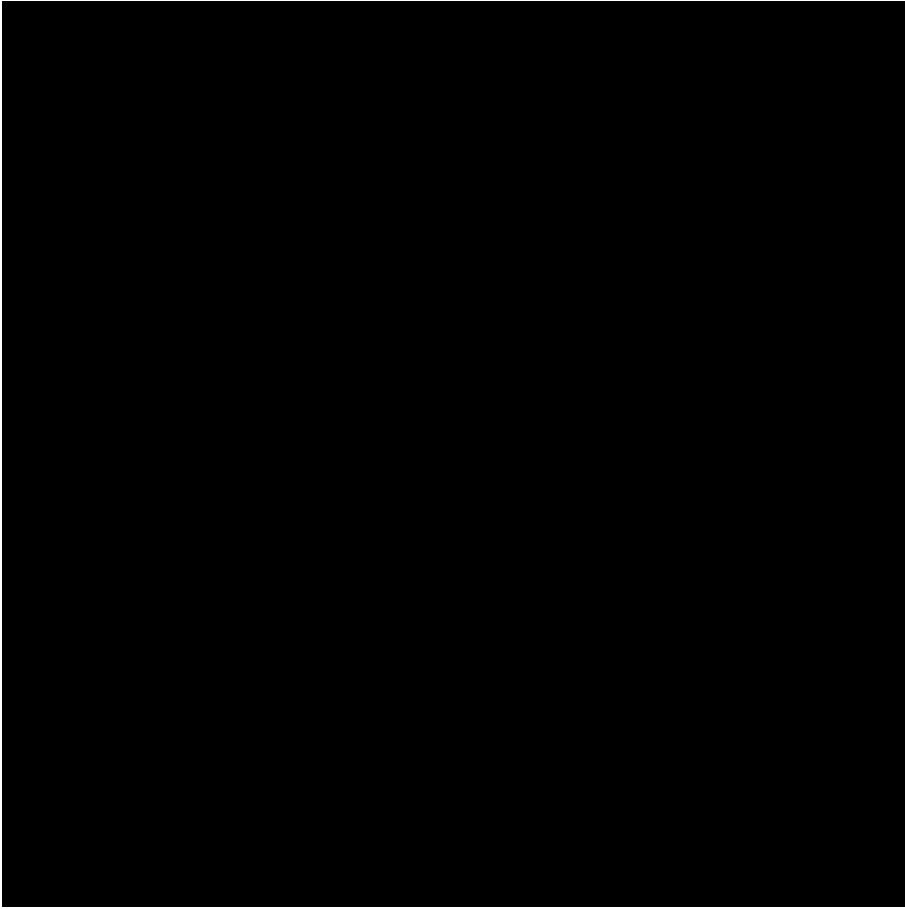
TEVAR (Thoracic EndoVascular Aortic Repair)

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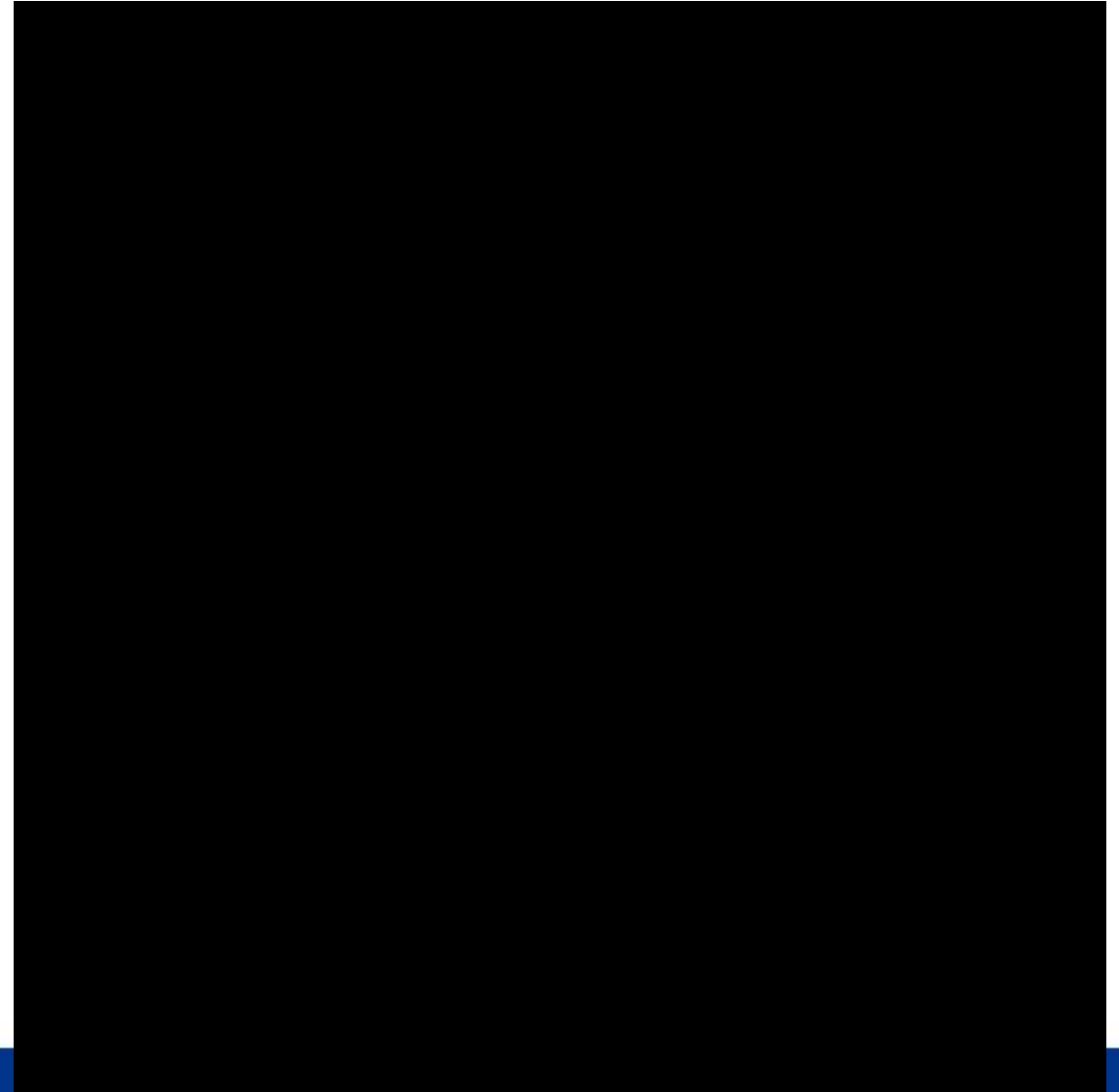
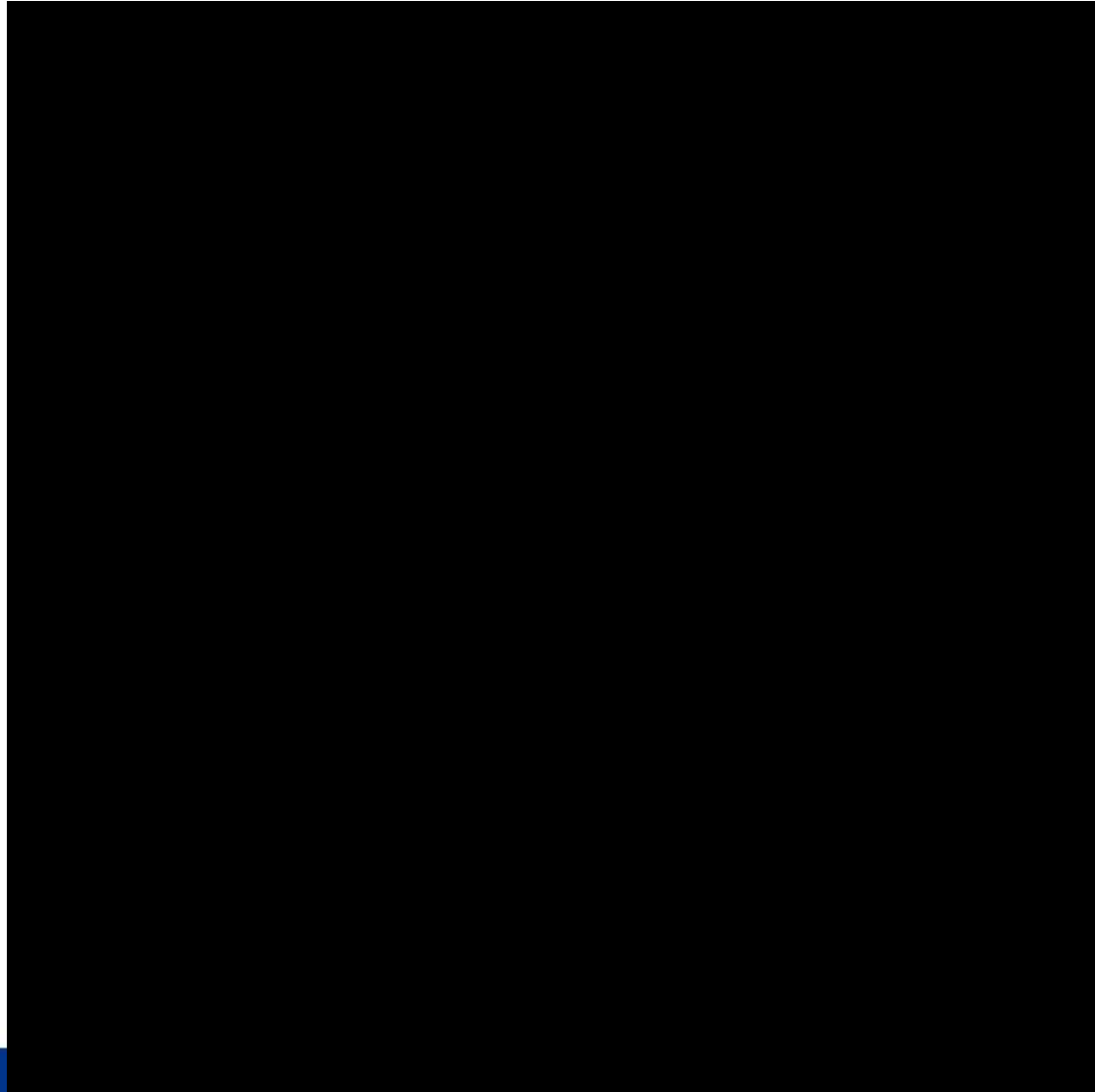
- Indication
 - Aortic aneurysm
 - Aortic dissection
 - (**Complicated** vs. uncomplicated)
 - **Traumatic aortic injury**
- Contraindication
 - Hypersensitivity in stent-graft
 - Condition that threatens to infect the graft



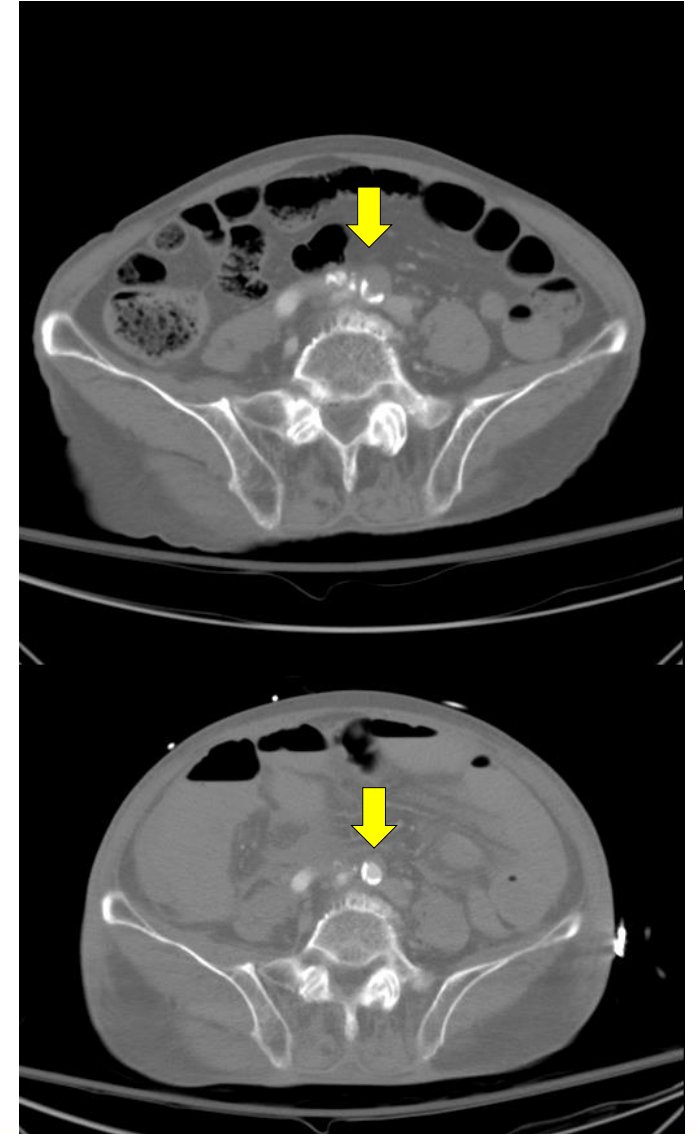
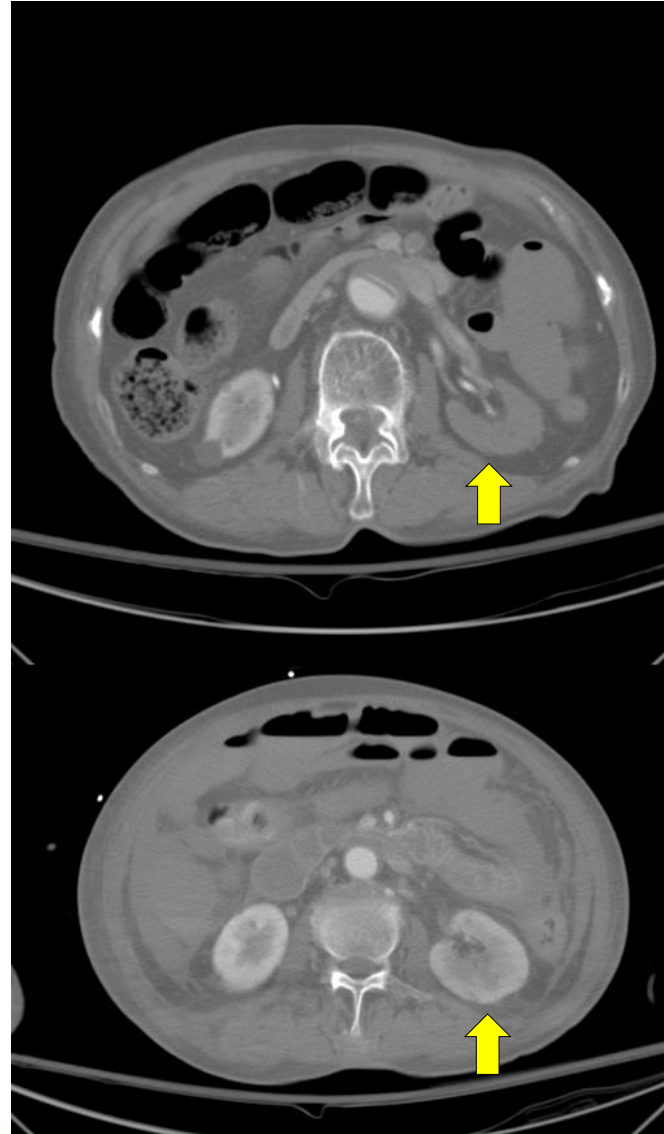
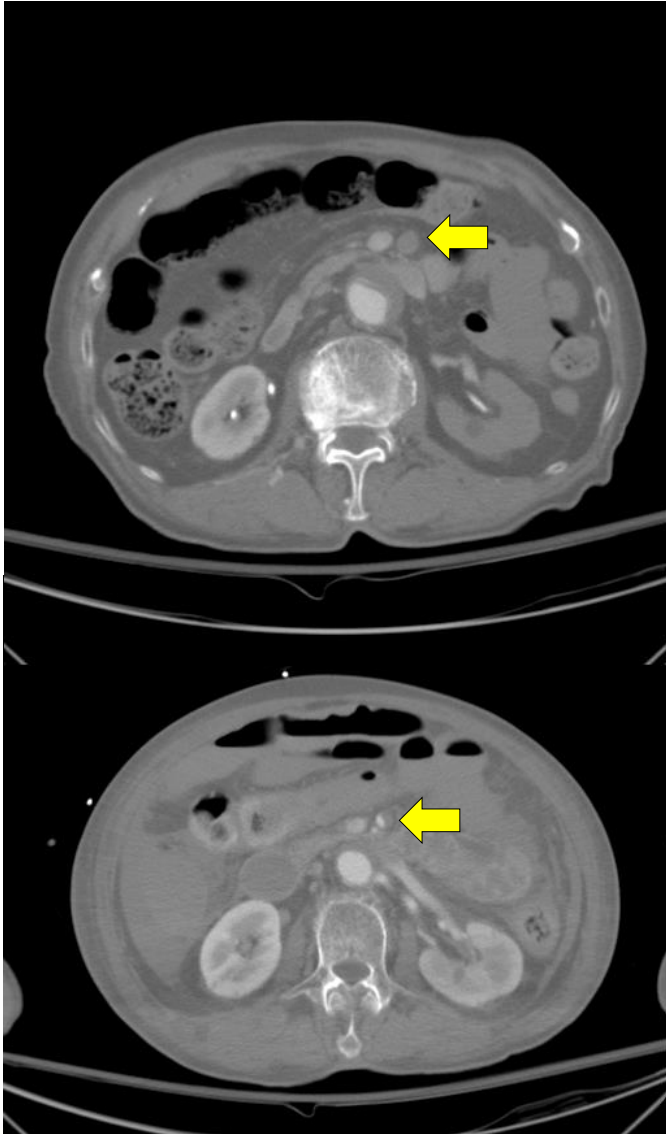
TEVAR in aortic aneurysm



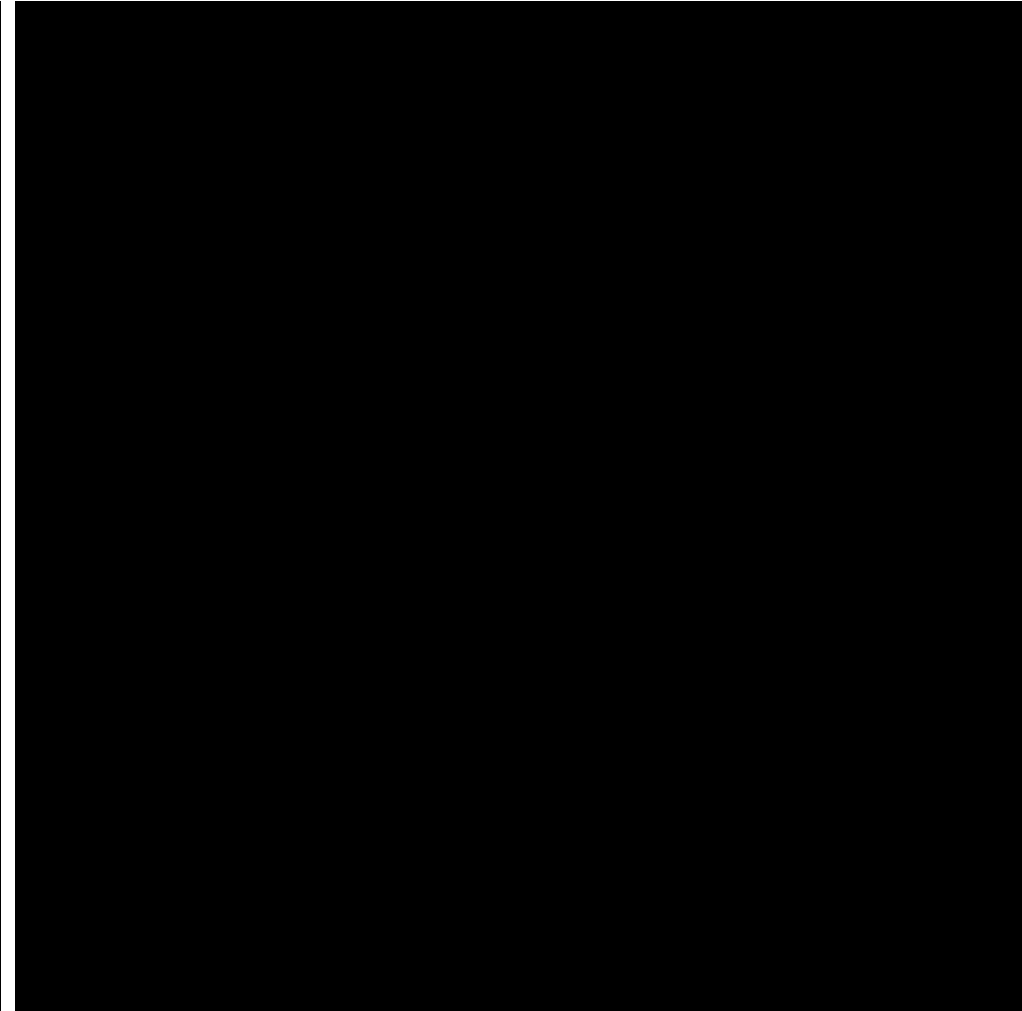
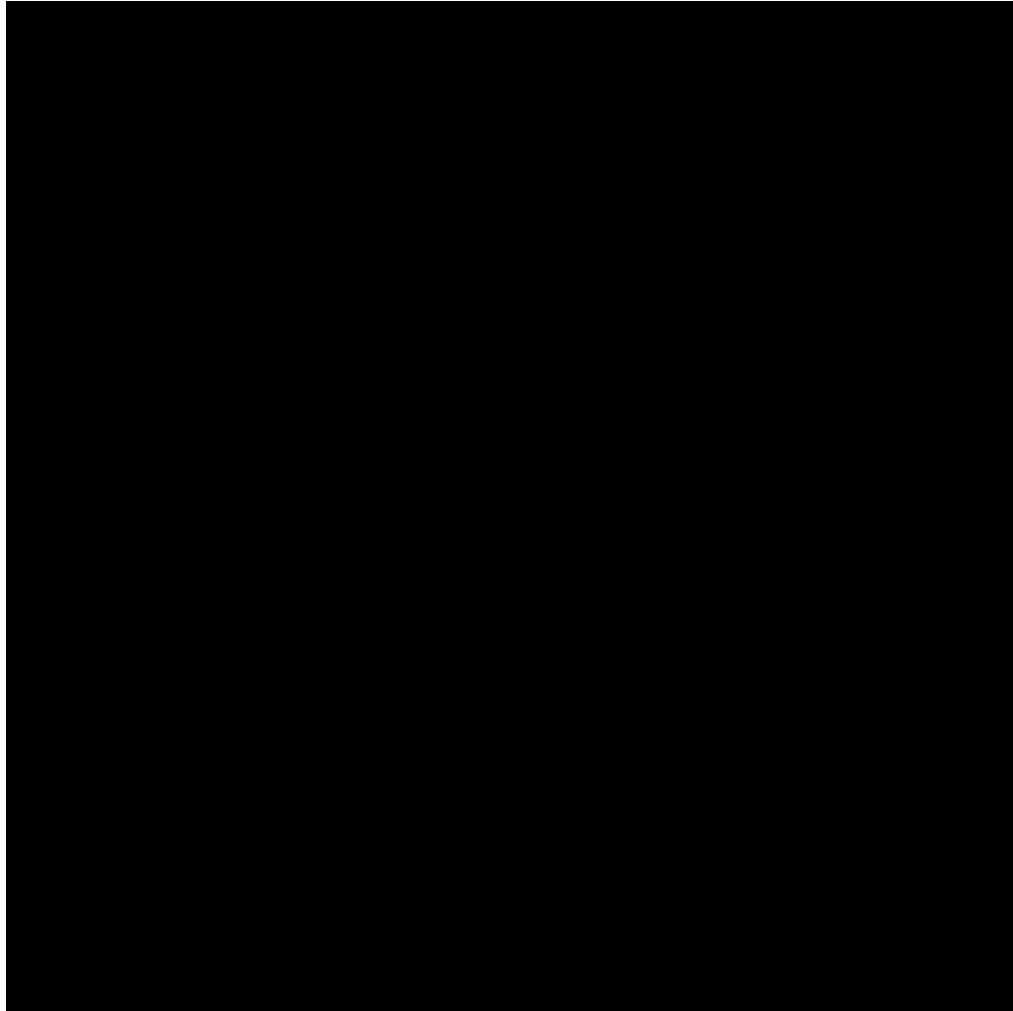
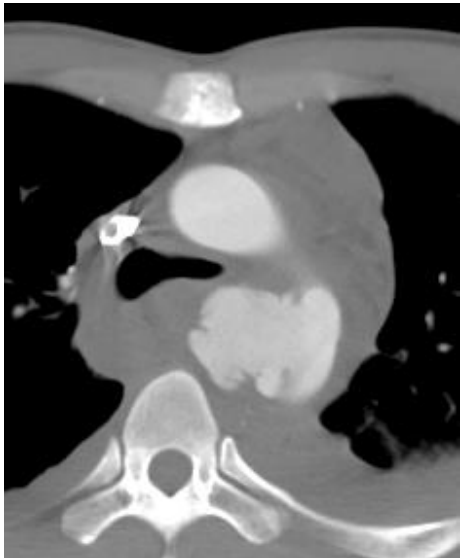
TEVAR in aortic dissection



TEVAR in aortic dissection

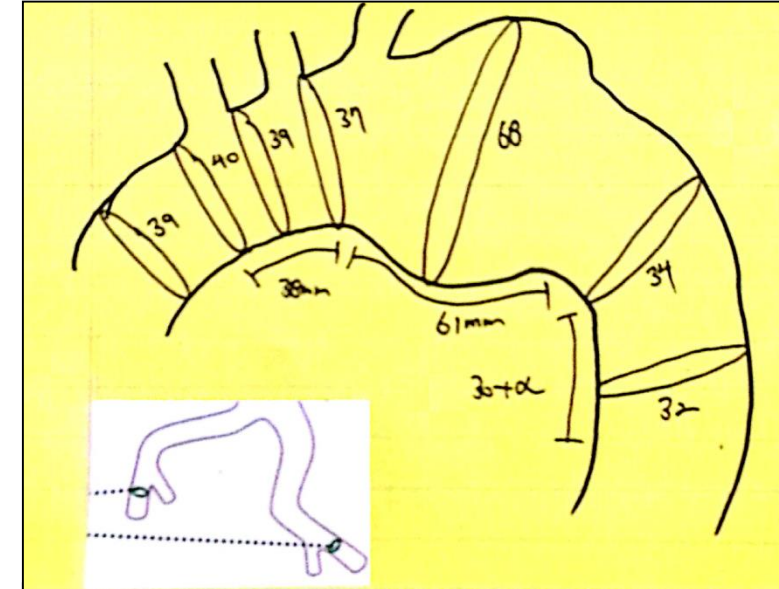


TEVAR in traumatic aortic injury

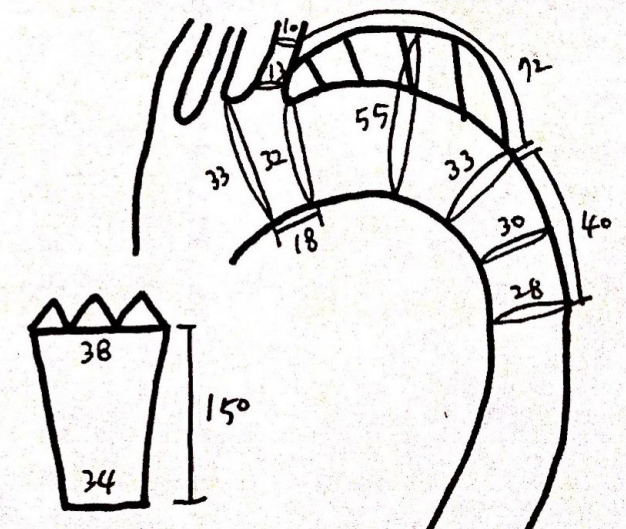


Planning

- Condition of access vessel
 - Iliofemoral artery & abd aorta
 - Tortousity & stenosis
- Proximal and distal landing zone
 - Angle & length
- Size of stent-graft
 - > 10-15% than native aorta
 - Tapered vs straight
 - Etiology
 - aneurysm, dissection, shock

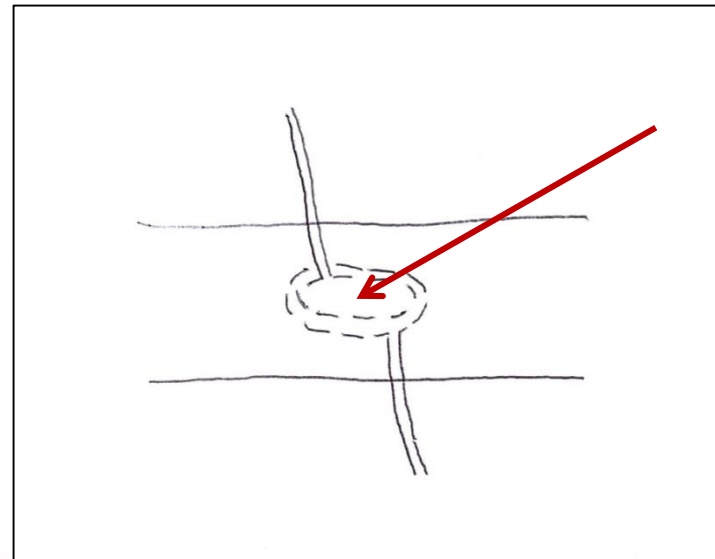


Drawing/Remarks



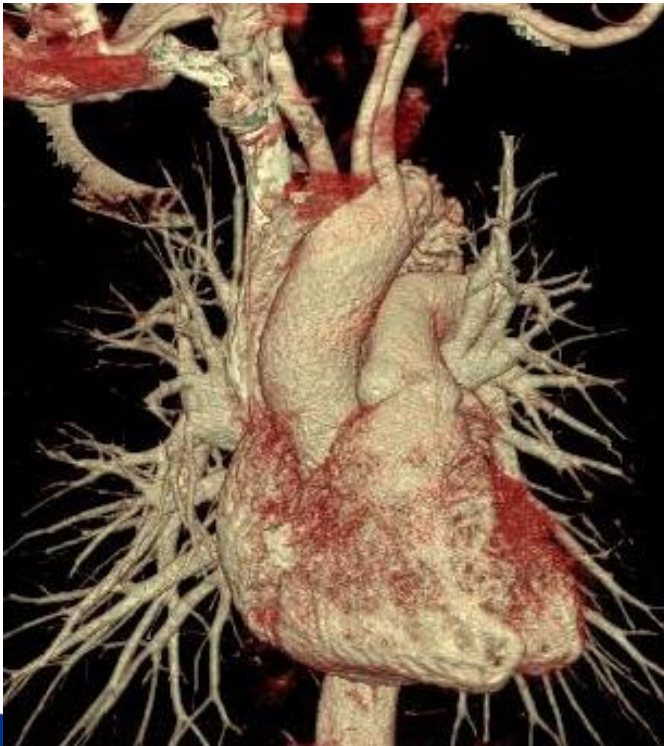
Approach

- **Percutaneous**
 - Preclosing with Perclose devices
 - Learning curve, costs....
- **Exposure**
 - Small incision
 - Purse-string suture (Prolene 5-0, x2)



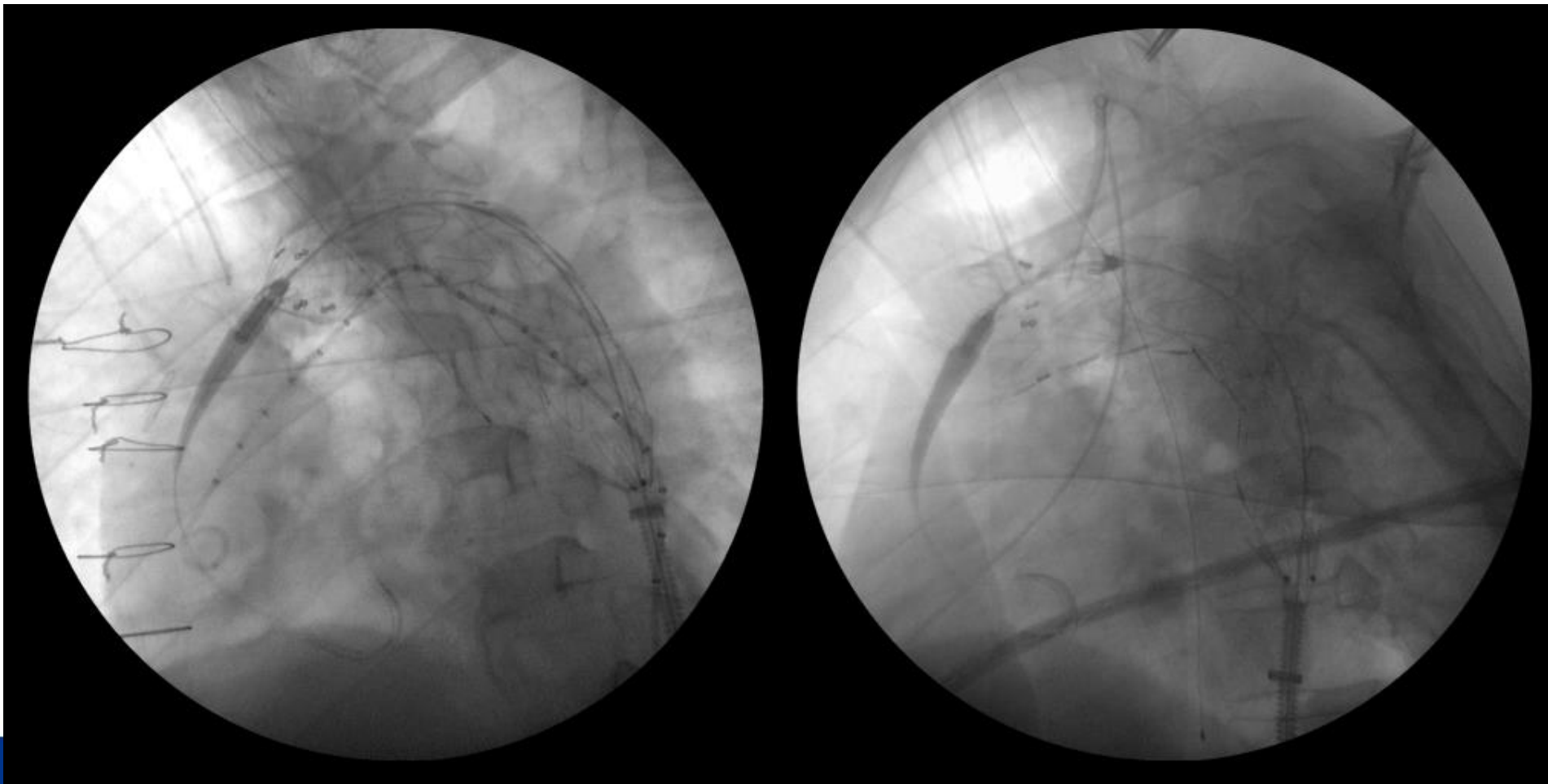
Initial aortography

- Angle 을 맞추는 것이 가장 중요!!
 - LAO vs RAO
 - cranial vs caudal



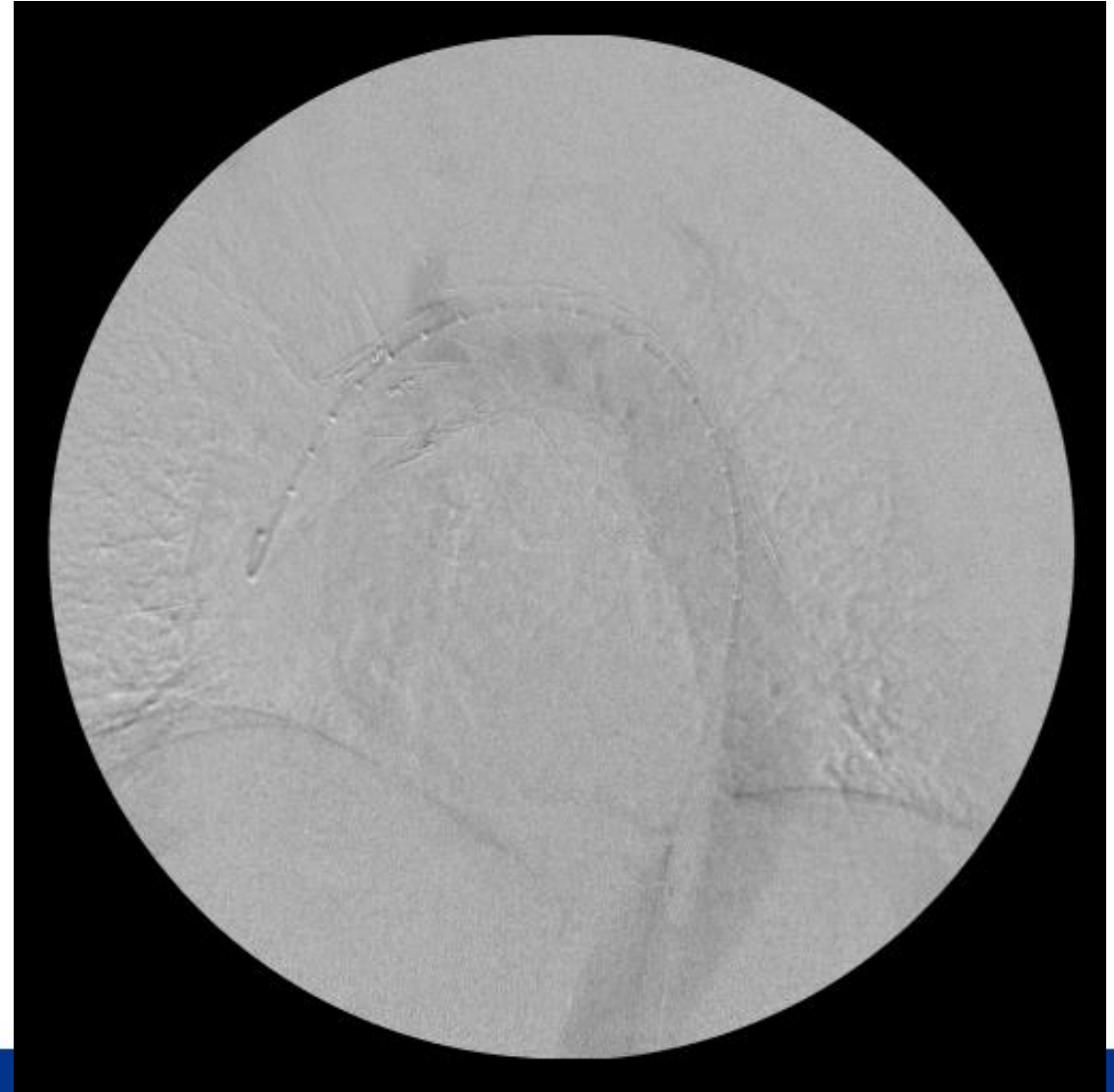
Stent-graft deployment

- Alignment of radiopaque markers!!



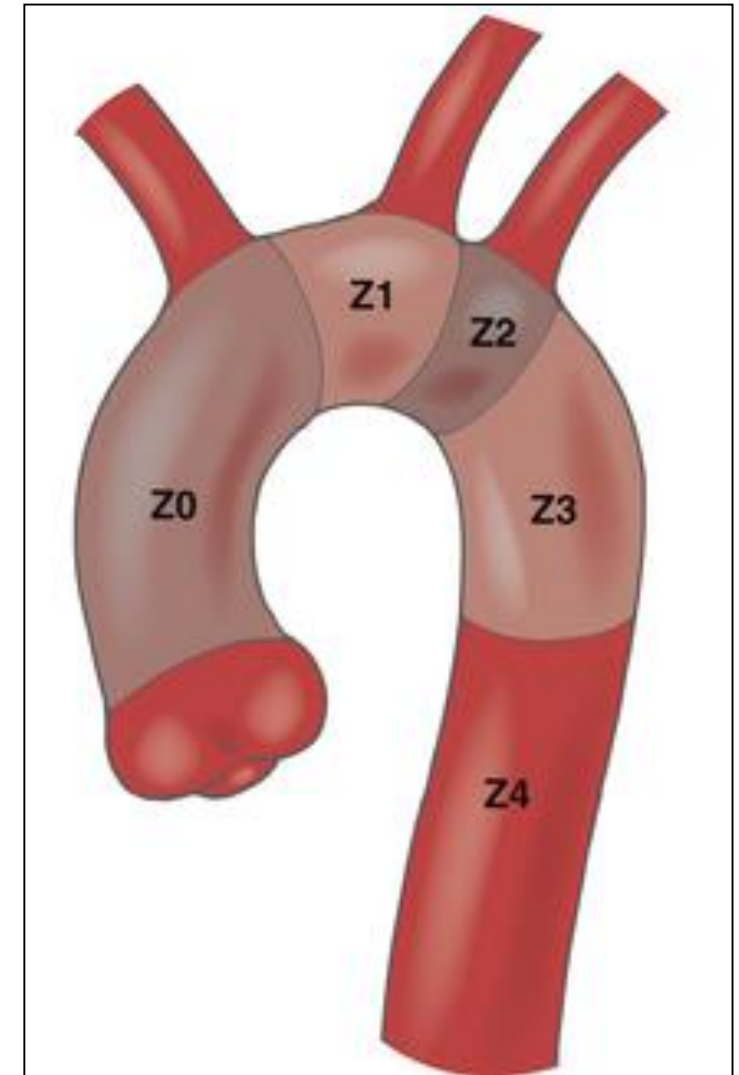
Stent-graft deployment

- Prevent migration of stent-graft!!
 - Fixation of left hand
 - Lower blood pressure
 - Rapid ventricular pacing



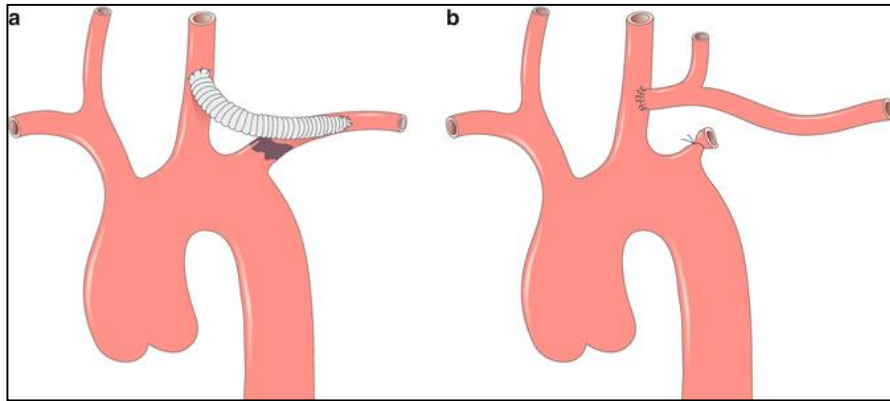
Hybrid TEVAR – proximal landing zone

- *Zone 0*: ascending aorta and proximal arch to innominate artery
- *Zone 1*: segment between innominate artery and left common carotid artery
- *Zone 2*: segment between left common carotid and left subclavian arteries
- *Zone 3*: segment beyond left subclavian along curved portion of distal arch
- *Zone 4*: straight portion of descending thoracic aorta starting at level of the 4th thoracic vertebra

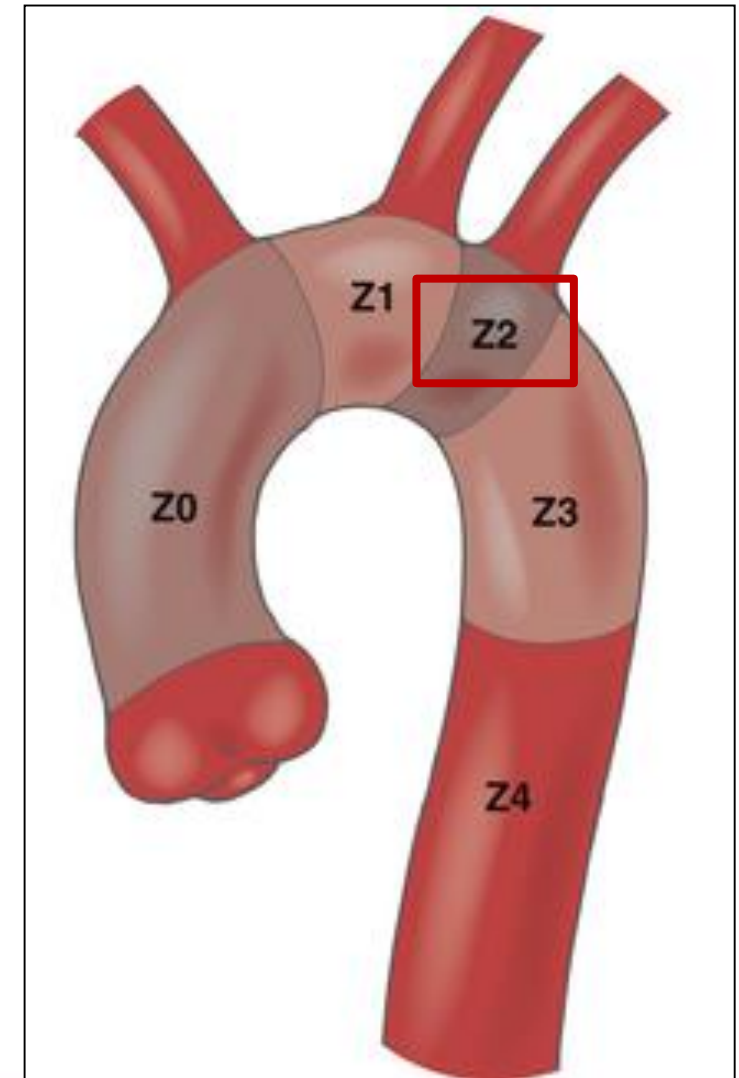
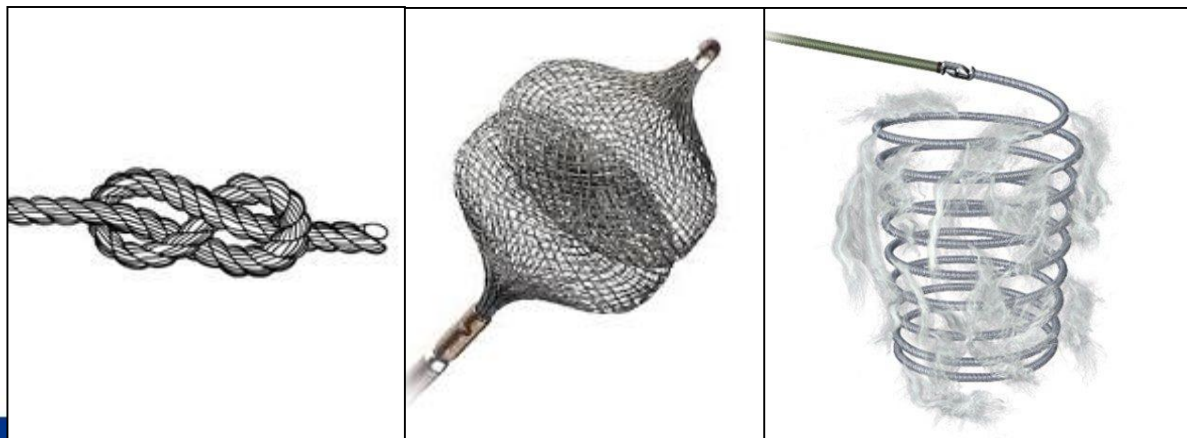


Zone 2 TEVAR

- LCCA-LSCA bypass or LSCA transposition

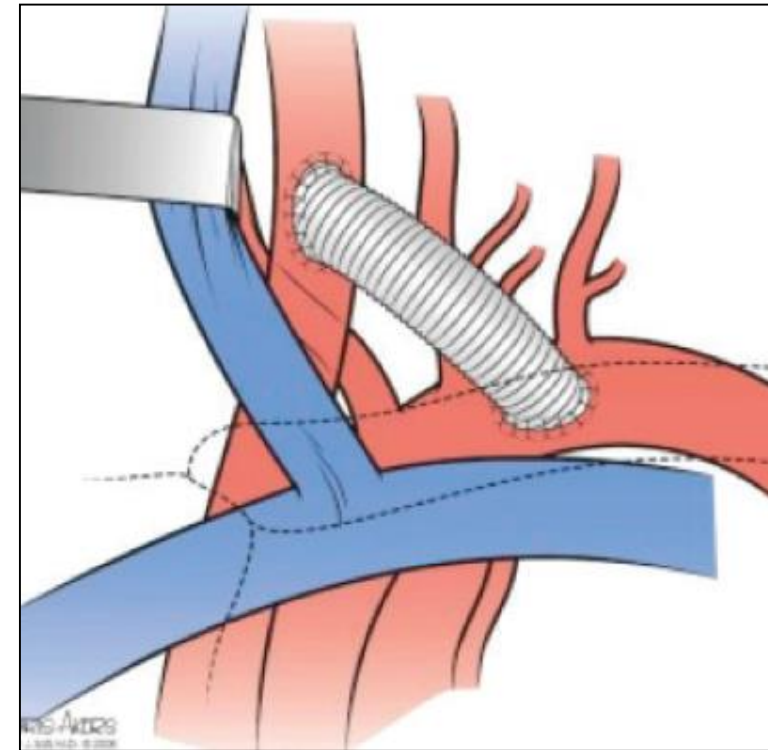
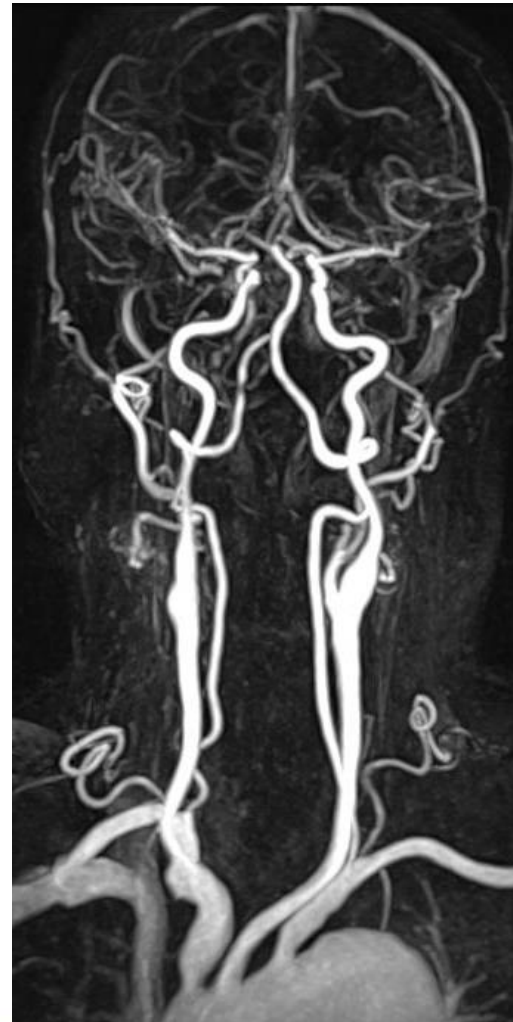


- Proximal LSCA ligation vs plugging vs coiling



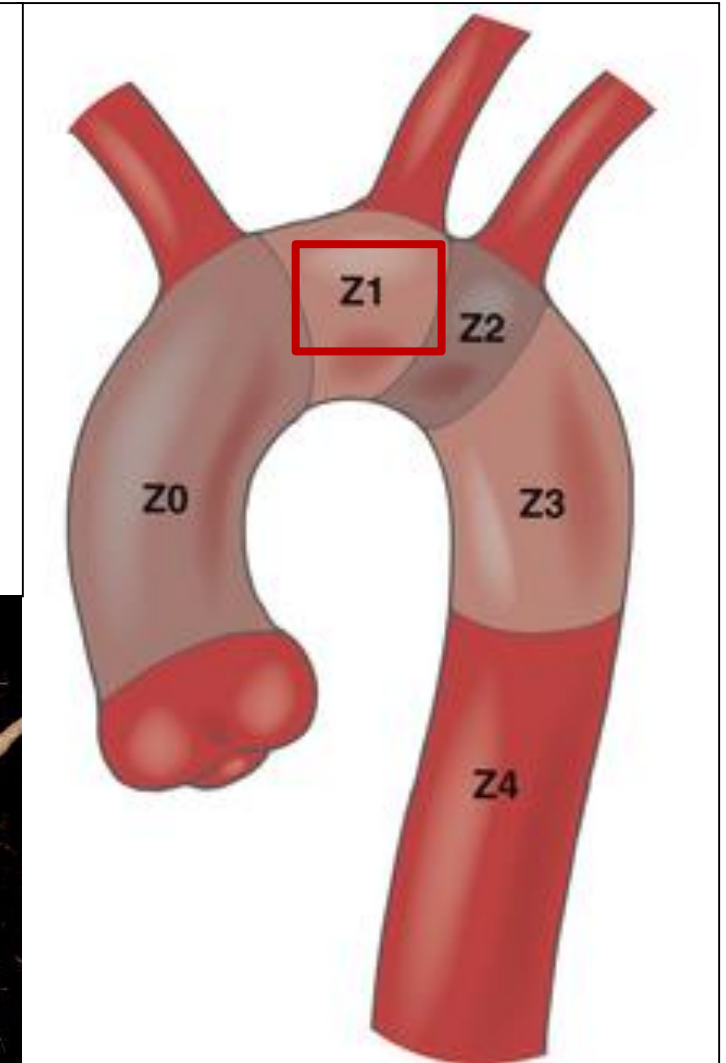
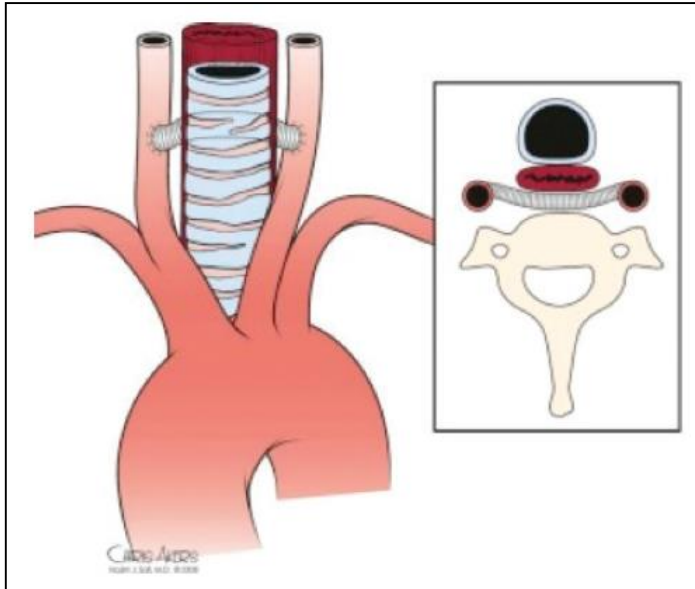
Consideration for zone 2 TEVAR

- LSCA bypass or not..??
 - Indication of LSCA revascularization
 - LIMA bypass
 - left vertebral dominance
 - isolated left brain hemisphere
 - left upper extremity dialysis access
 - Younger or left-handed patients
- LCCA-LSCA bypass
 - Supraclavicular incision

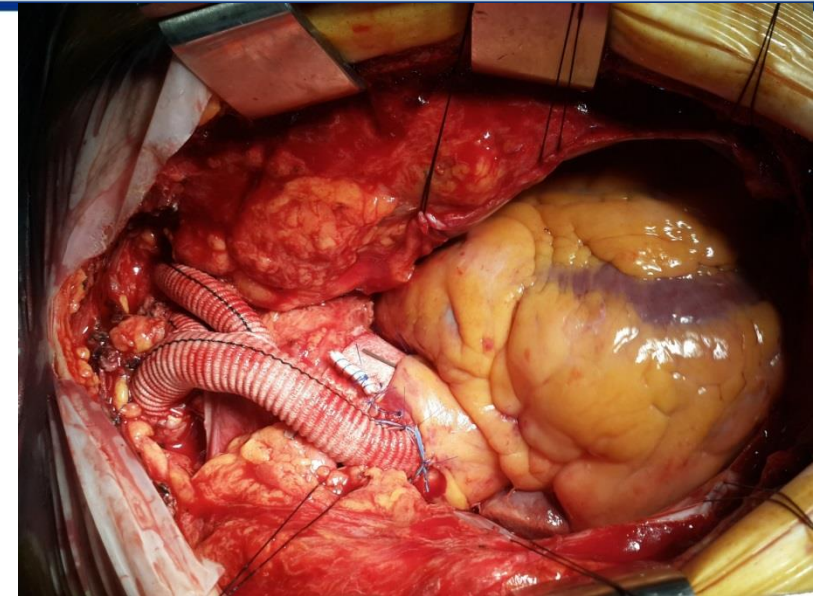
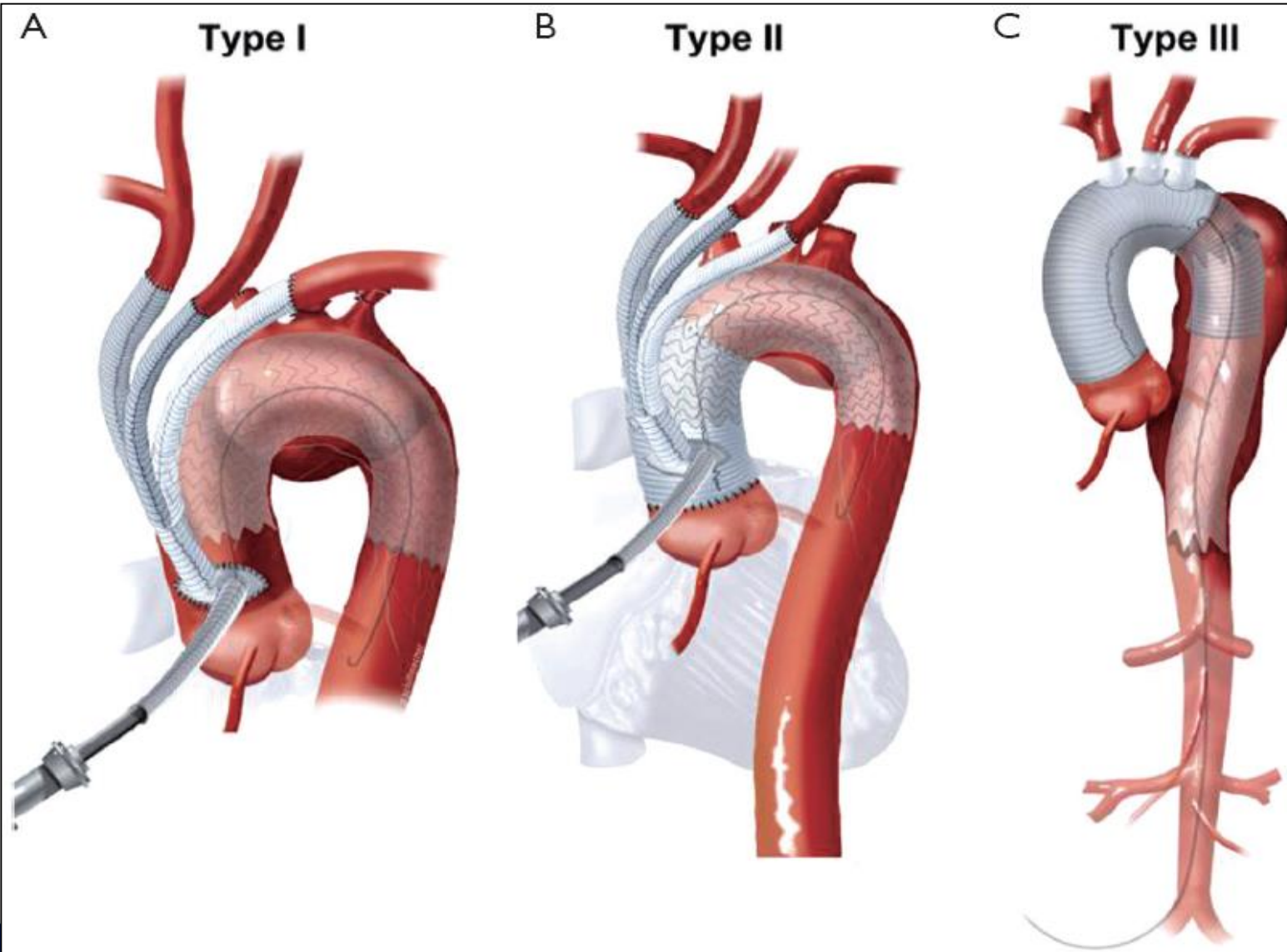


Zone 1 TEVAR

- Carotid-carotid bypass
 - Retropharyngeal route
 - Subcutaneous route
- IA-LCCA-LSCA bypass
 - Upper partial sternotomy



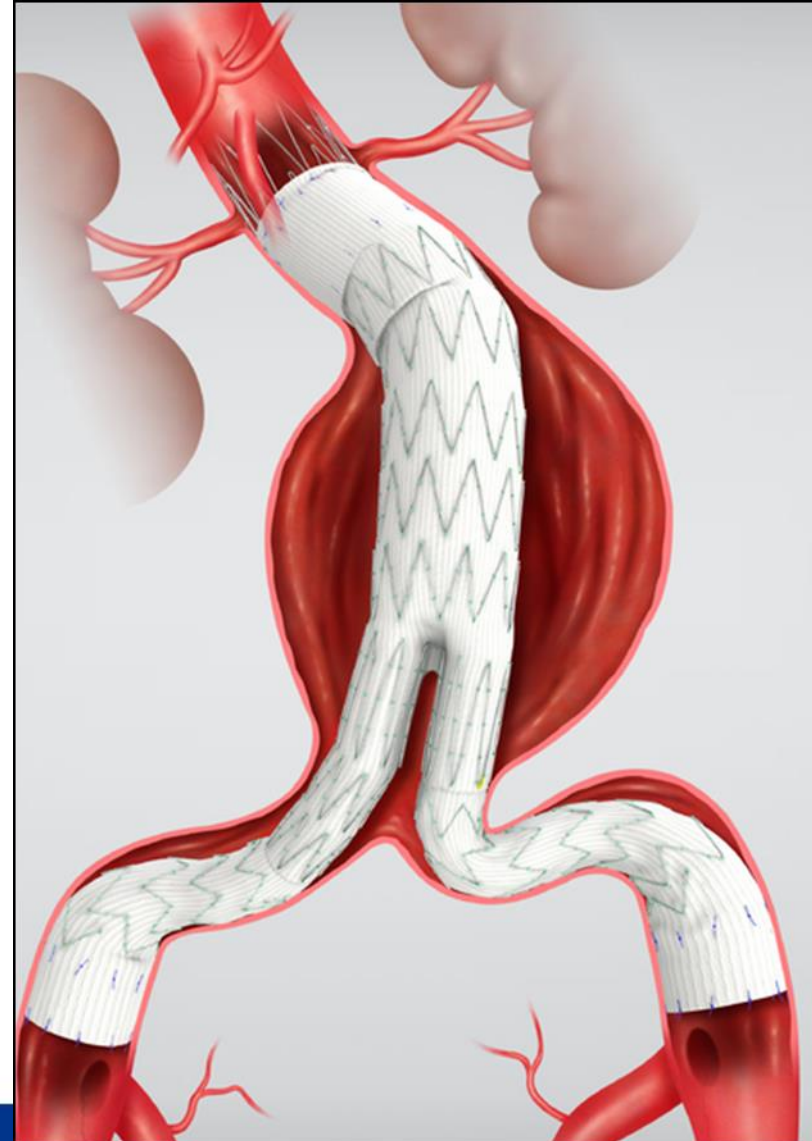
Zone 0 TEVAR



EVAR

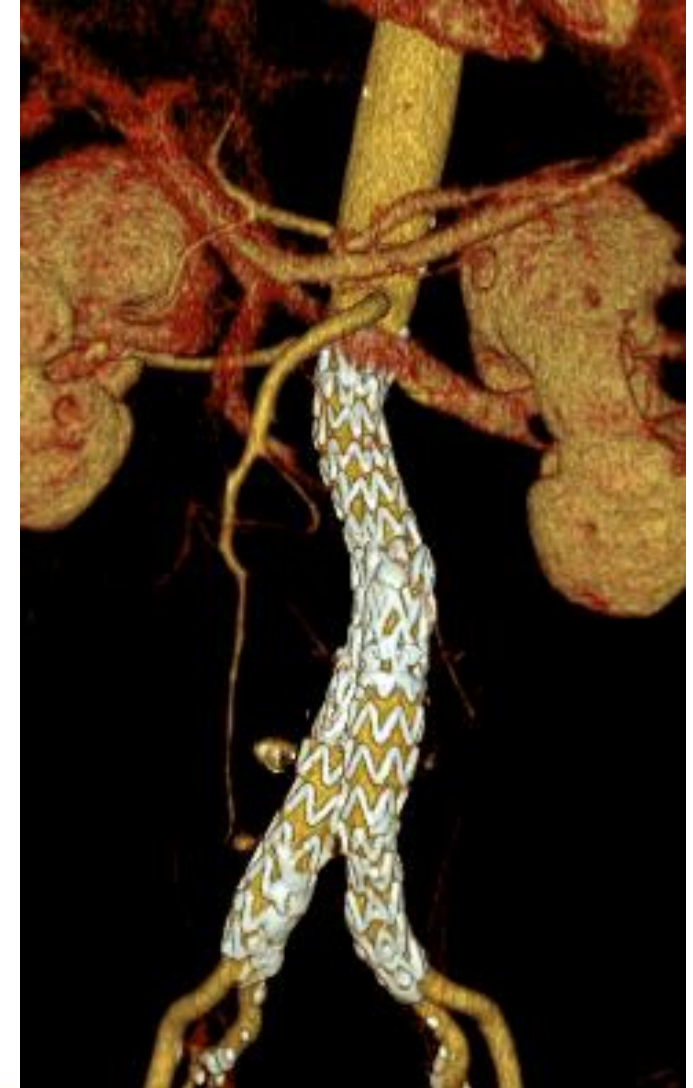
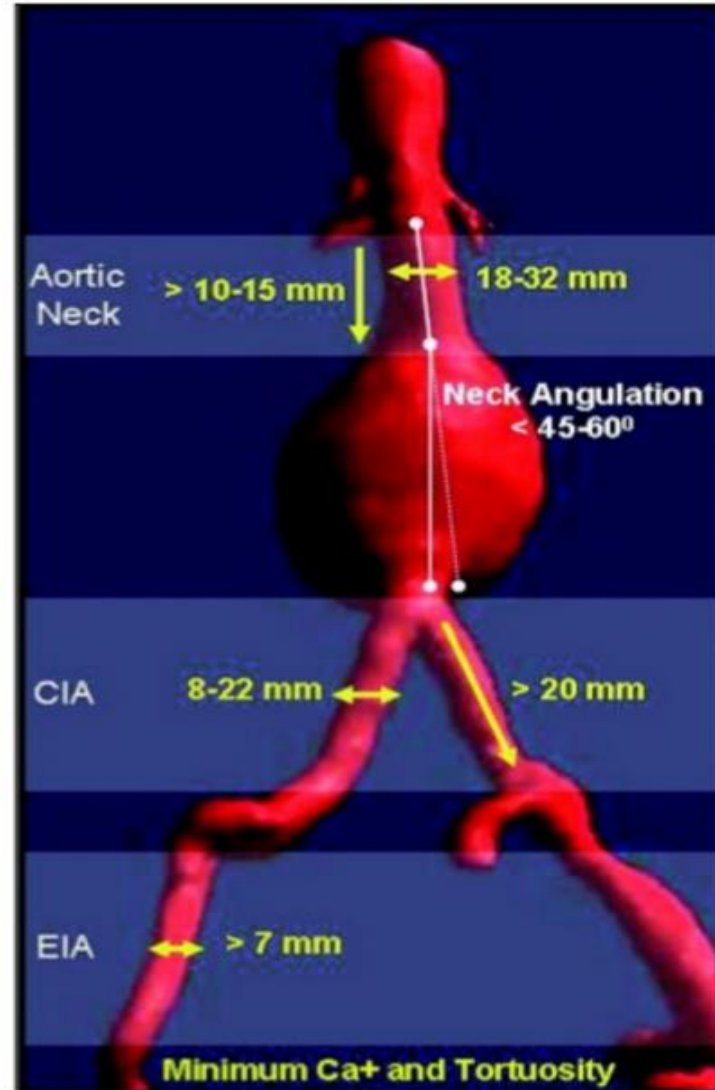
Indication of EVAR

- Symptomatic or ruptured AAA
- Diameter > 50mm
- Rapid growing
- Saccular aneurysm
- Iliac aneurysm



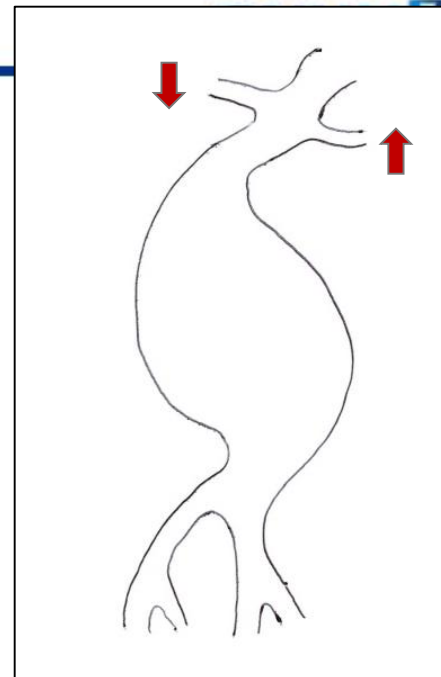
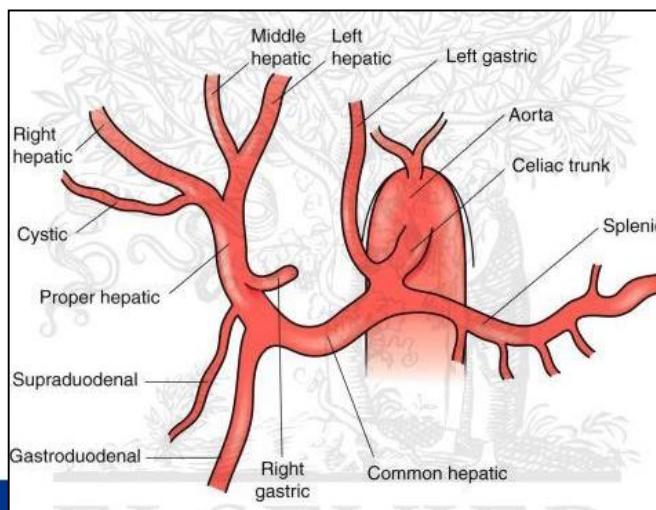
Patient selection for EVAR

- Proximal landing zone
 - Diameter / Length
 - Shape (conical)
- Distal landing zone
 - Diameter / CIA length
- Angulation
 - Proximal neck / Iliac
- Ilio-femoral condition
(for access)

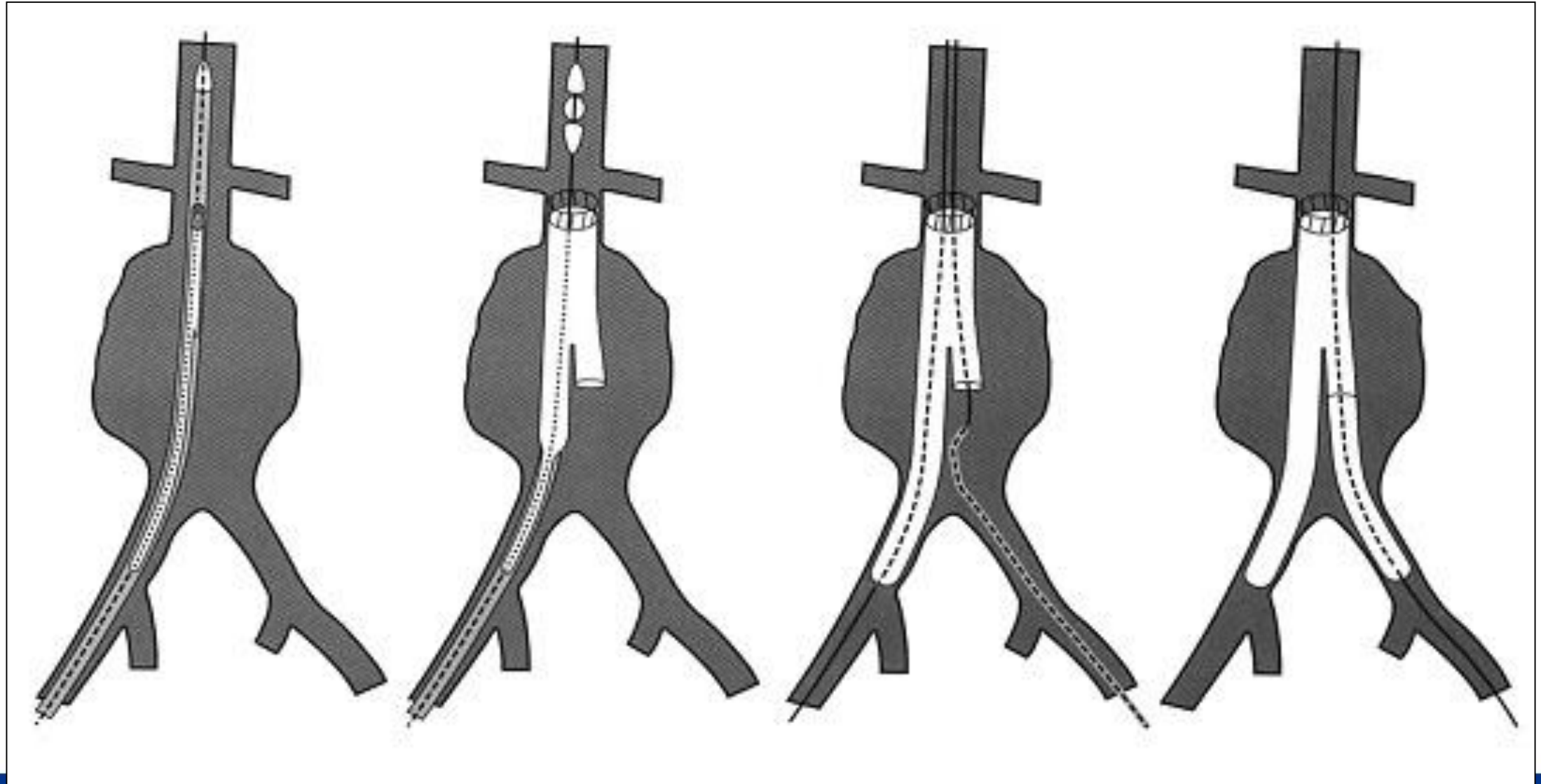


Initial aortography (1)

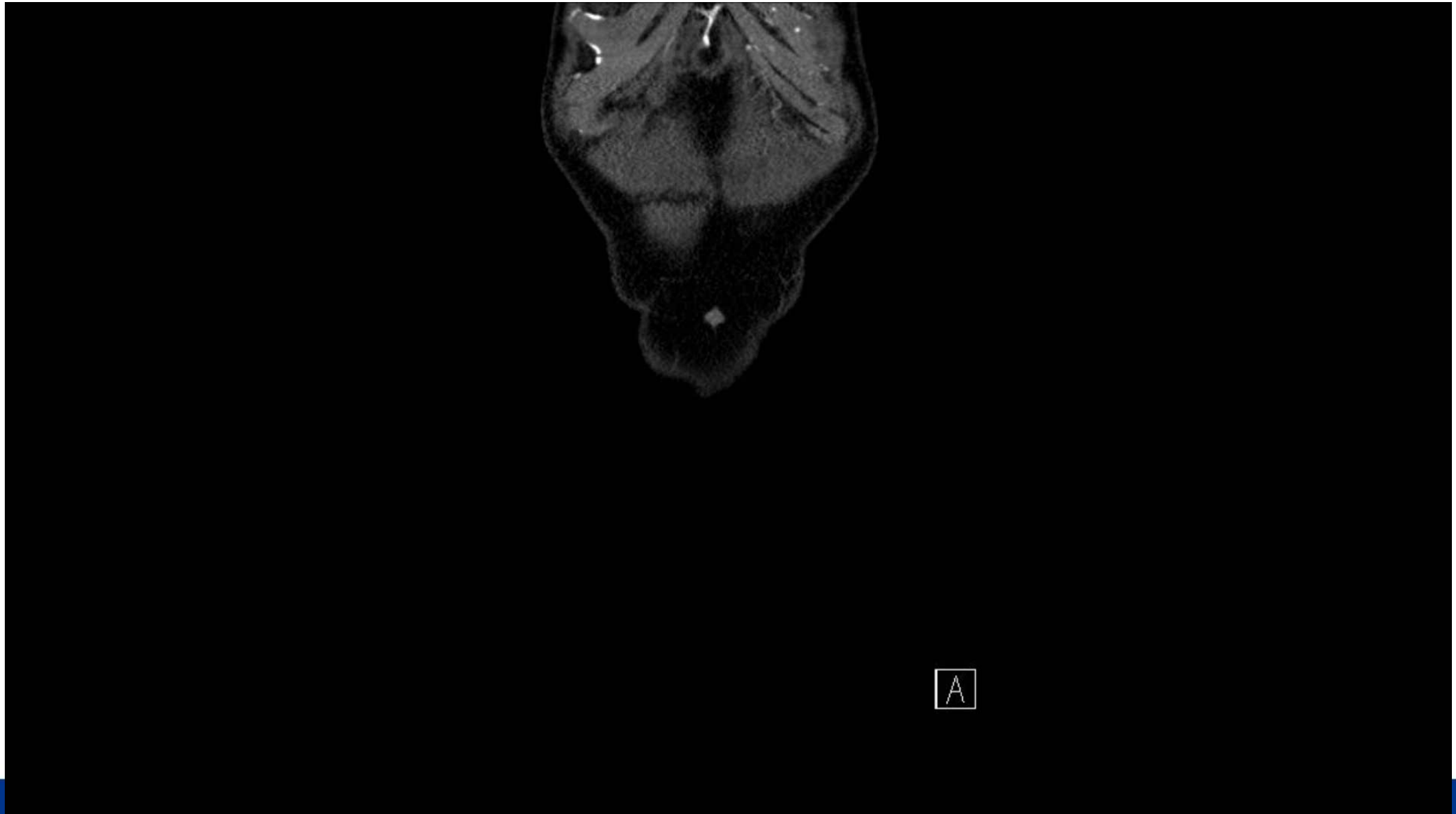
- Renal arteries
 - Usually between L1 & L2
 - Should check the lowest renal artery
 - Should not be confused celiac trunk
(common hepatic a & splenic a)



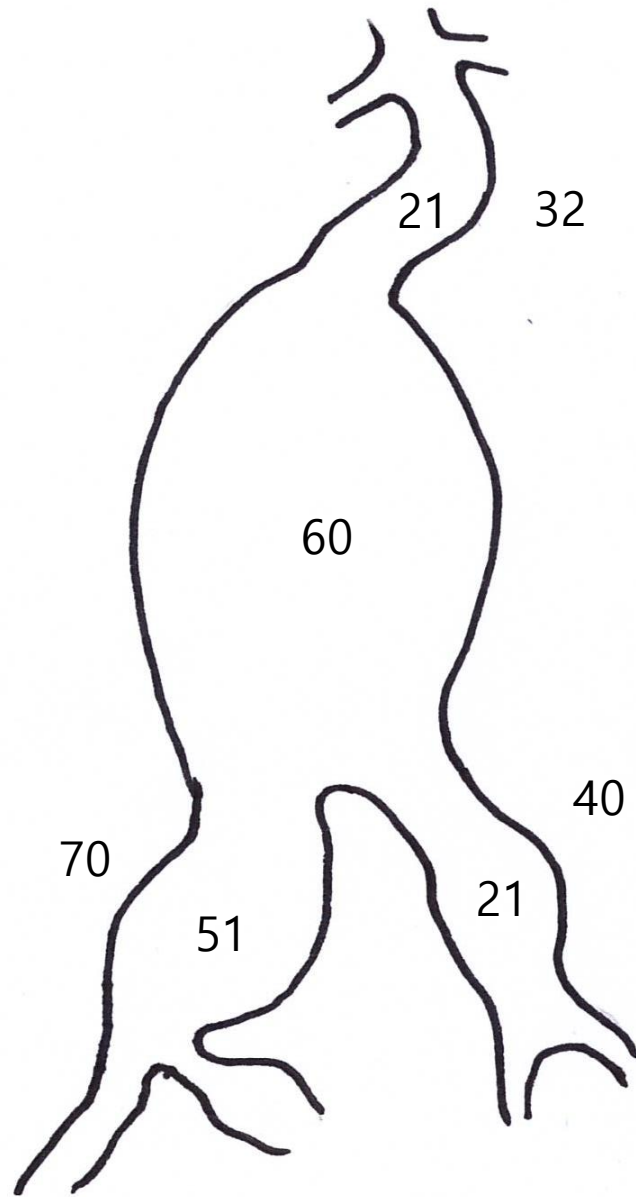
Procedure

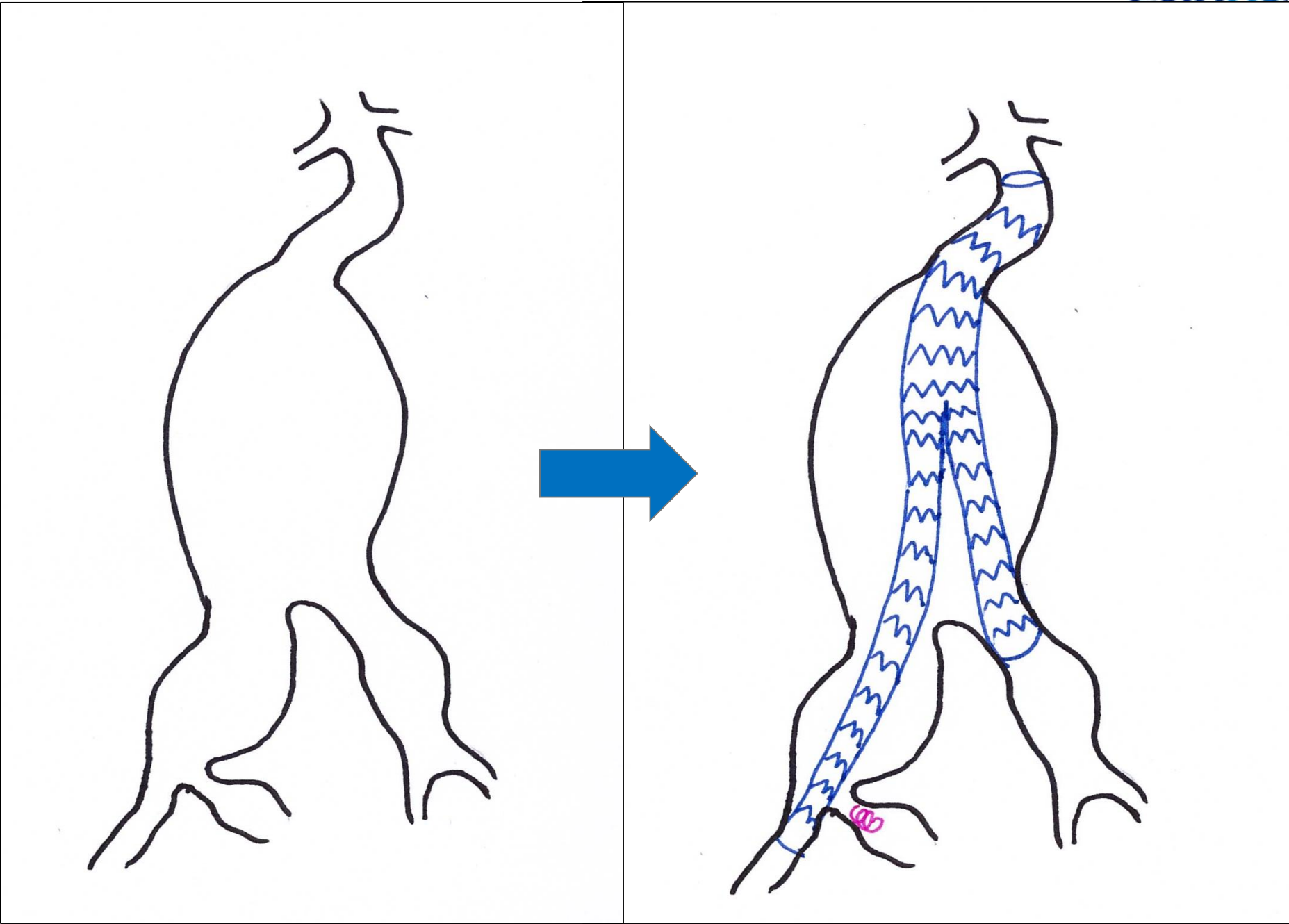


Case



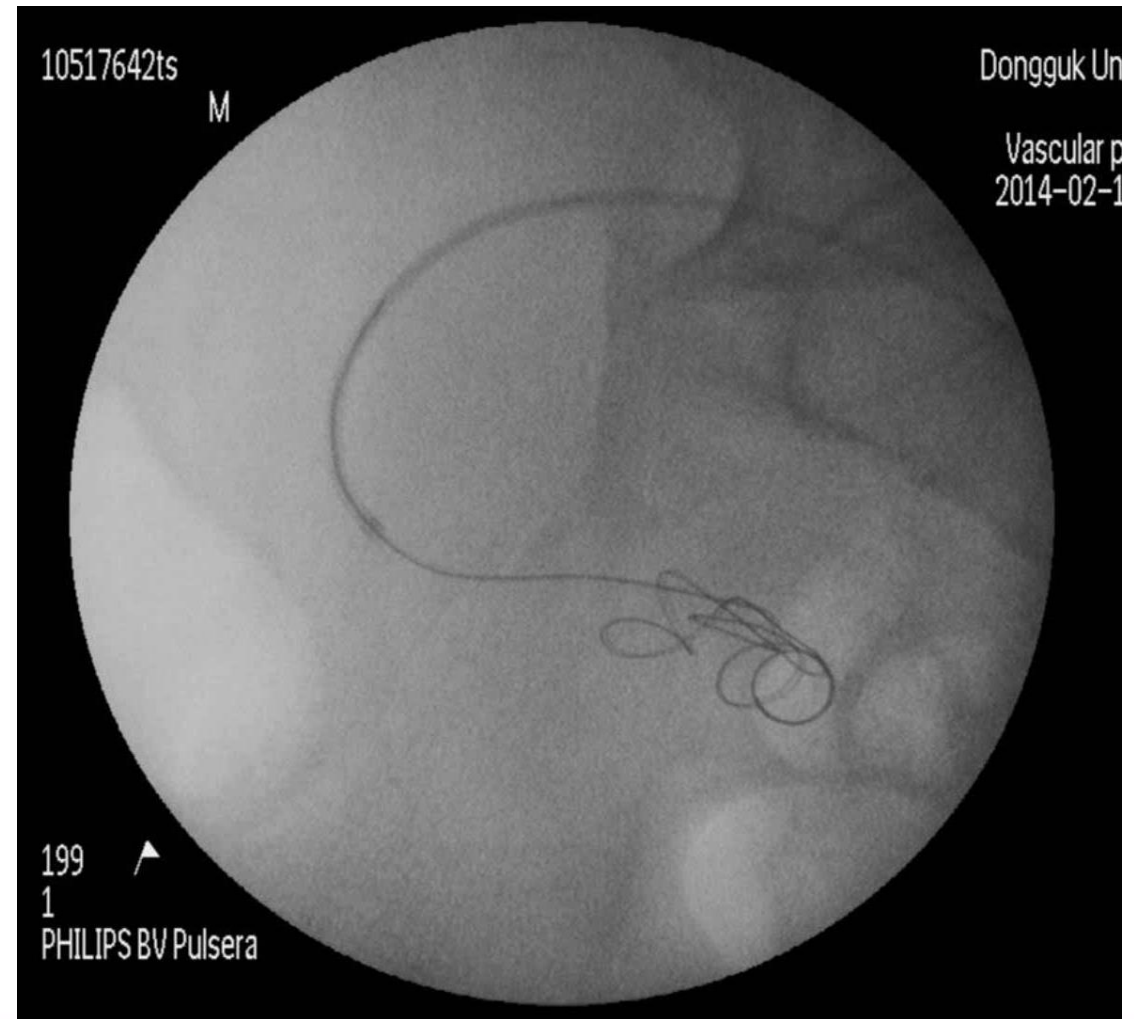
(mm)





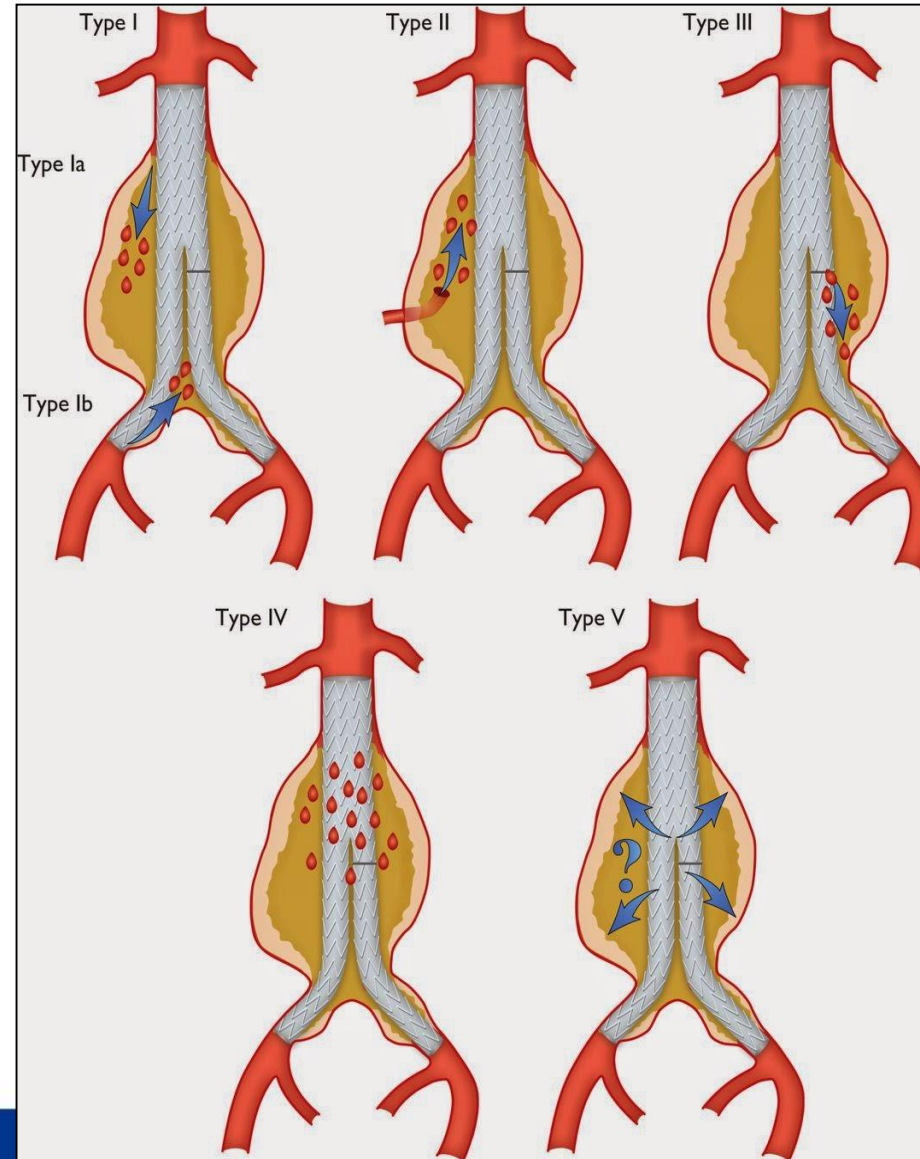
Internal iliac artery embolization

- Coiling vs plugging
- Buttock or thigh claudication
- Sexual dysfunction (impotence)
- Bowel ischemia
- Spinal cord ischemia
- Avoid bilateral IIA embolization..!



Endoleak

Type	Definition
Type I	Persistent filling of the aneurysm sac due to incomplete seal or ineffective seal at the proximal (type IA) or distal (type IB) end of the stent graft
Type II	Persistent filling of the aneurysm sac due to retrograde branch flow from collateral vessels
Type III	Blood flow into the aneurysm sac due to inadequate or ineffective sealing of overlapping graft joints or rupture of the graft fabric
Type IV	Blood flow into the aneurysm sac due to the porosity of the graft fabric, causing blood to pass through from the graft and into the aneurysm sac
Type V	Aneurysm sac expansion without clear evidence of endoleak origin



Complications (1)

- **Device related**
 - Graft migration, kinking, endoleak
- **Procedure related**
 - Dissection, malpositioning,
 - Thromboembolism, ischemic colitis, paraplegia
 - Groin hematoma, wound infection
- **Systemic complications**
 - Contrast induced nephropathy (CIN)
 - Post-implantation syndrome (PIS)

What approach..?

- (T)EVAR
 - Minimal incision
 - No aortic cross clamping
 - No extracorporeal circulation
 - Lower operative mortality rate
 - Lower morbidity rate
 - Lower hospital stay
 - Good choice for patients with important comorbidities
 - .. *But not for everyone..*
 - .. *Long term results..??*
- Open surgery
 - No suitable proximal and distal landing zones
 - No suitable stent-grafts
 - Lack of vascular access
 - Connective tissue disorders

Thank you for your attention~!

