

A 3D CT angiography image of the abdominal aorta and its major branches, including the renal arteries. The aorta is shown as a central, vertical, golden-brown structure. The renal arteries branch off to the left and right kidneys, which are depicted as large, reddish, textured masses. The background is dark, highlighting the vascular structures.

Management of Complications During Endovascular Abdominal Aortic Repair and Follow-up

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Potential Endoluminal Graft Complications

Early

- Iliac Dissection/Rupture
- Limb ischemia
- Thromboembolic Event
- Renal failure (crossing the renal arteries)
- Ischemic bowel
- Wound complications
- Endoleak

Late

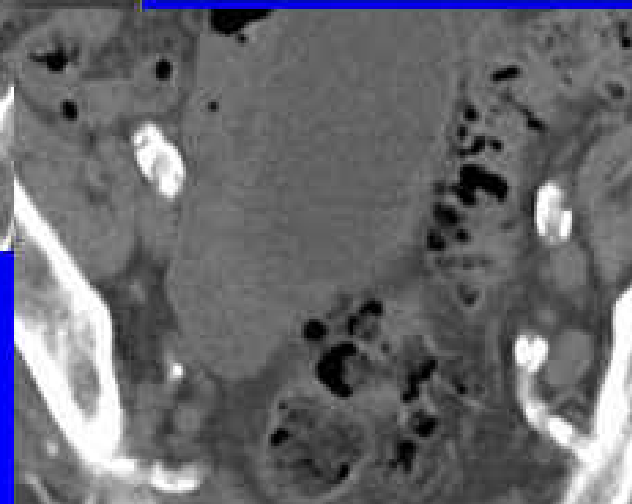
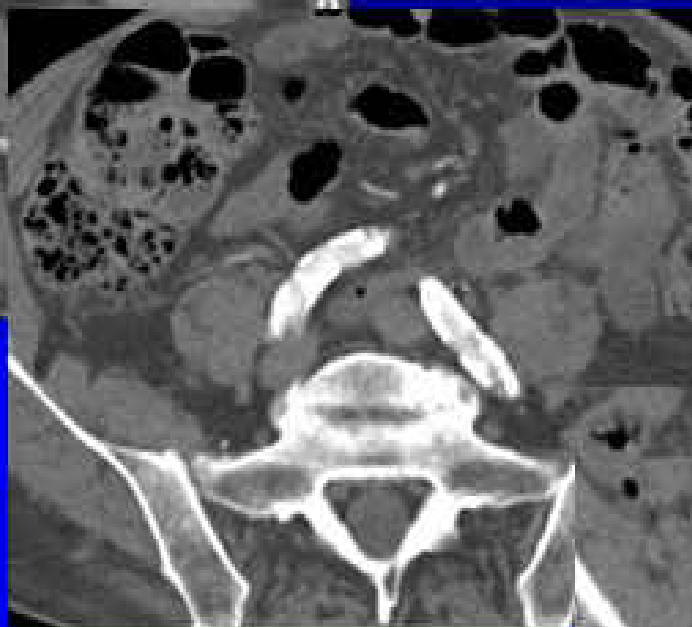
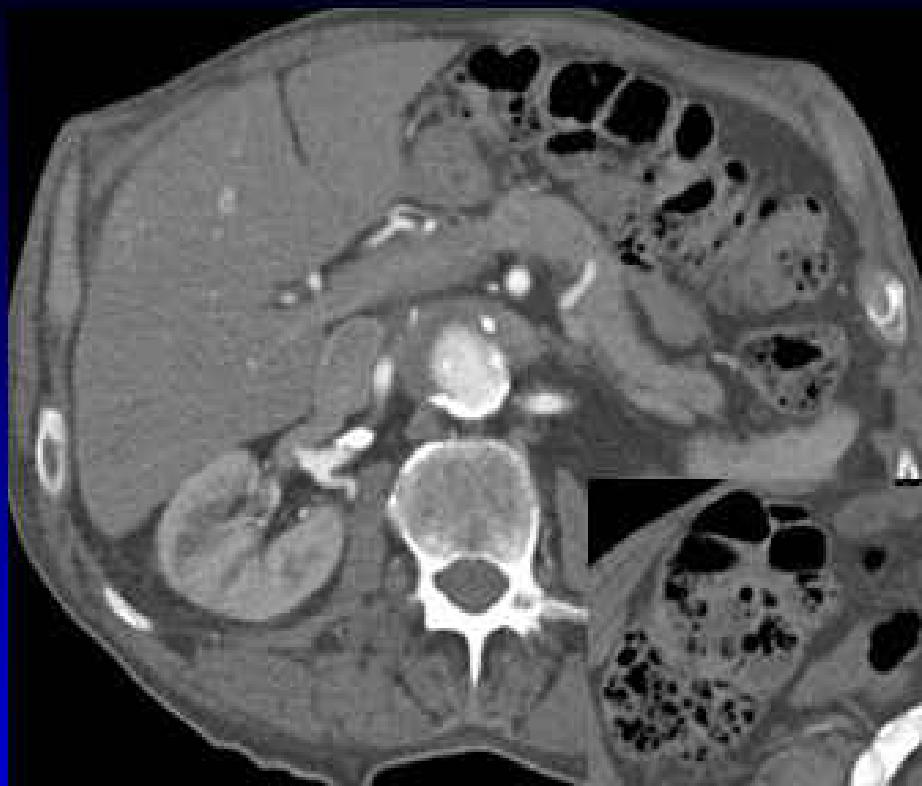
- Endoleak
- Limb Occlusion
- Graft Migration
- Graft material failure - prosthetic Leak
- Aneurysm rupture

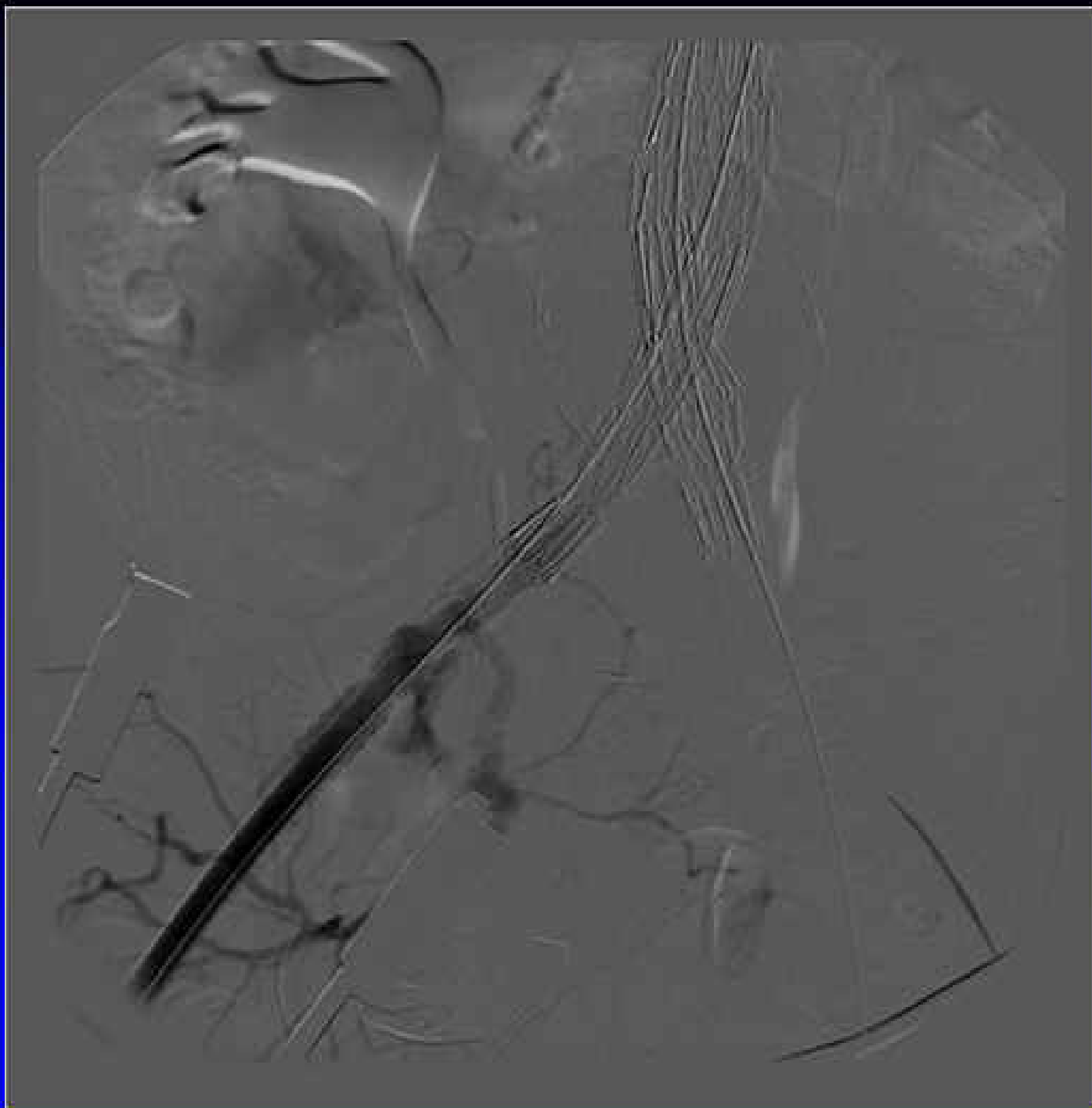
ACCESS ISSUES AORTIC ENDOGRAFTS

Large sheath
Inflexible devices

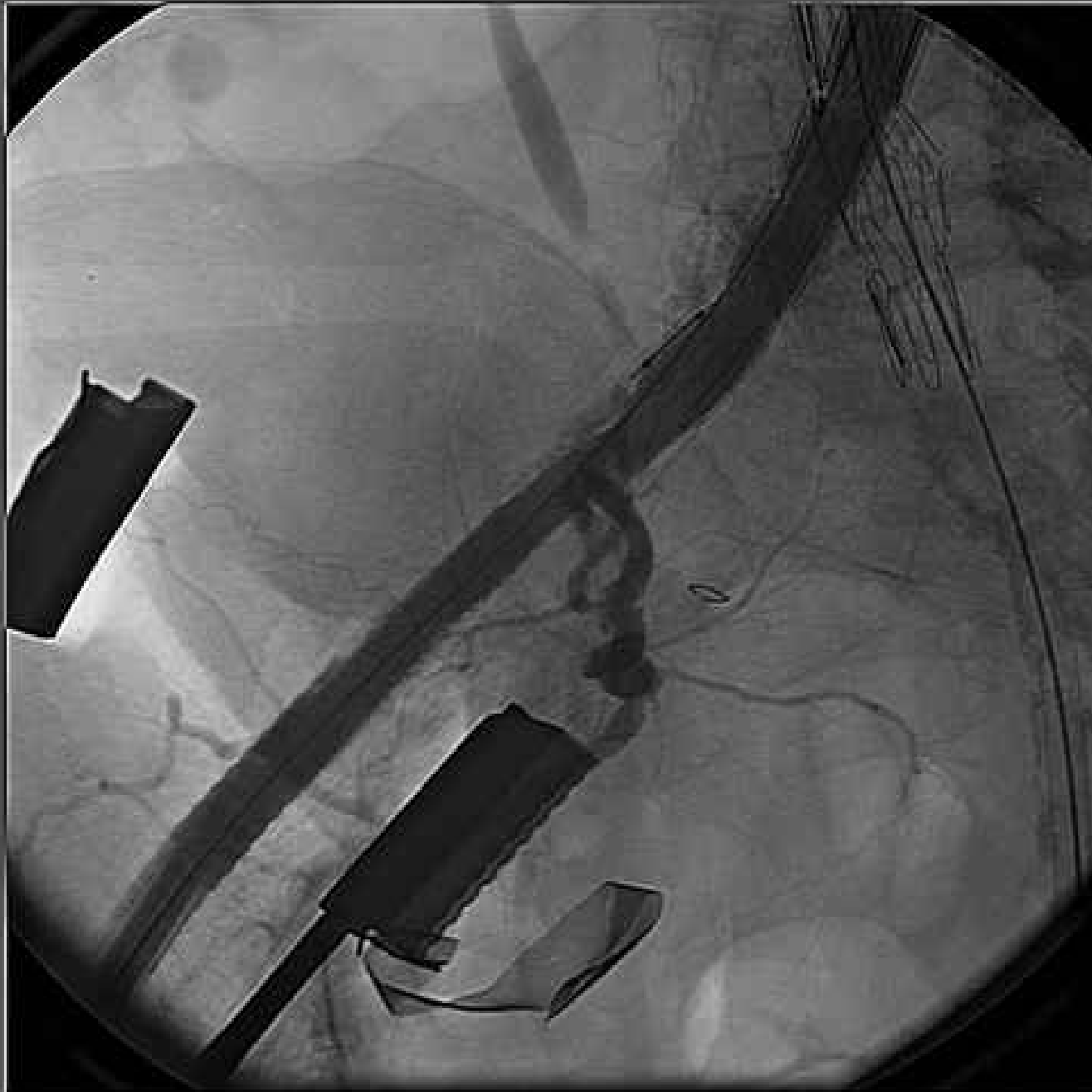
DANGER !!

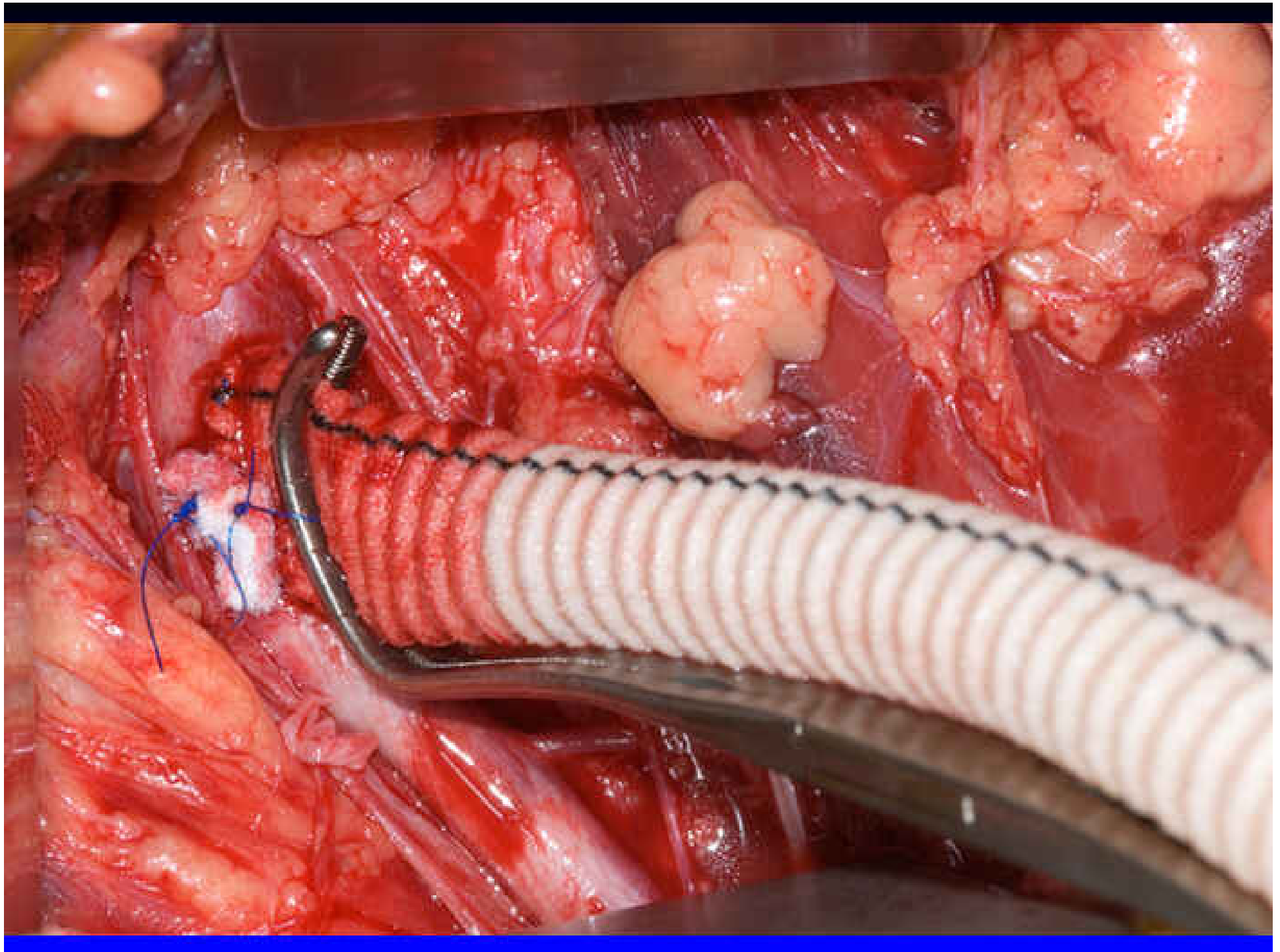
Calcification
Tortuosity
Small iliacs (women)

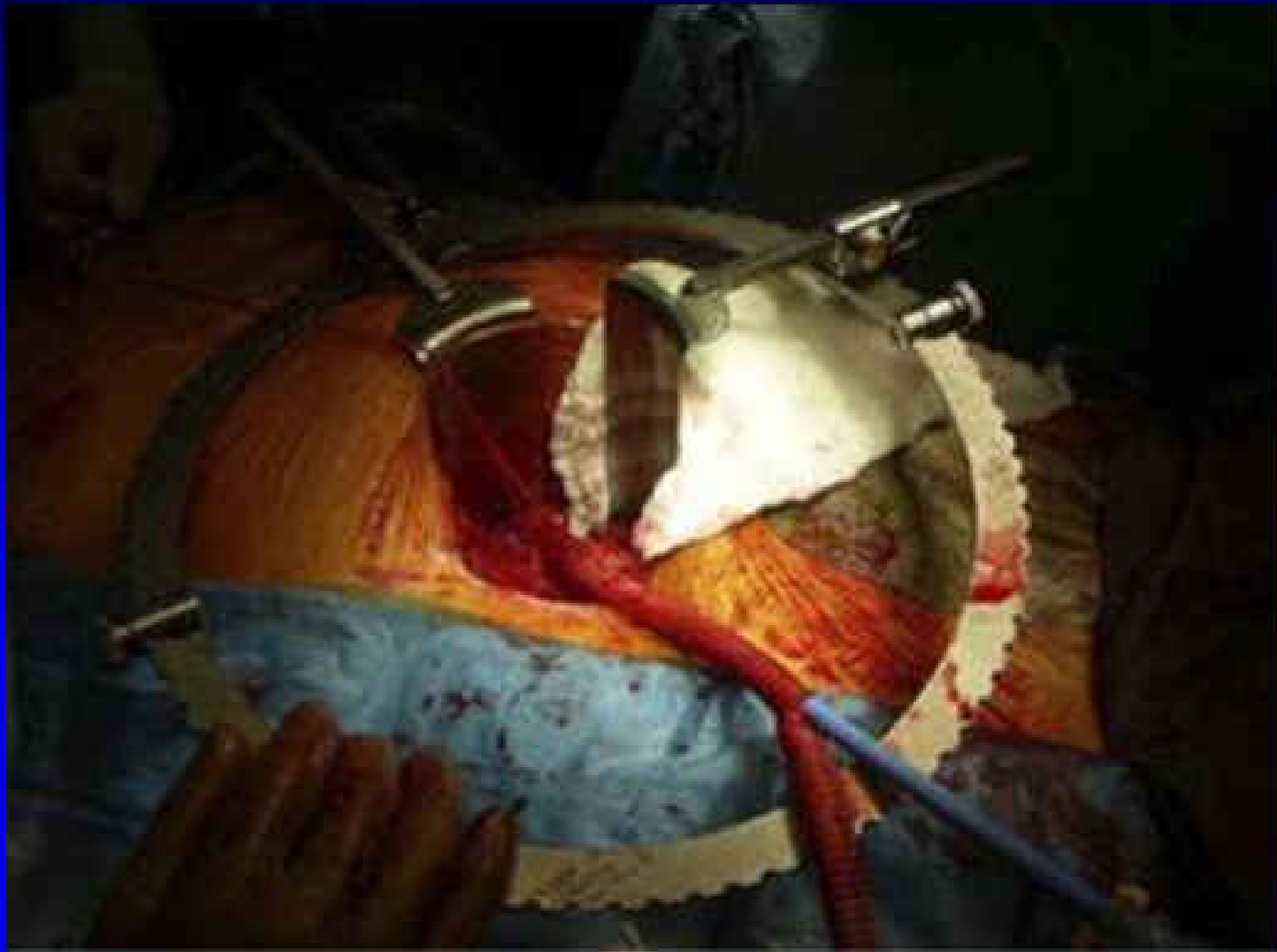












Aortic Rupture During Endograft Repair



Large Diameter Occlusion Balloons



- Available in 32 and 40 mm diameter
- 10 Fr bi-lumen catheter
- 100 or 120 cm length
- Polyurethane semi-compliant material
 - Long tapered tip
 - Radiopaque markers
- Low post-deflation profile
- Rapid inflation/deflation rate



Complication – Stent Graft Across Renal Artery

- Management options:
 - Renal artery Stent
 - Advance guidewire across flow divider into contralateral limb, externalize wire, pull on both ends of guidewire (“dental floss” technique) to move the graft distally and uncover renal arteries
 - Inflate large balloon in proximal graft and pull down

Bowel ischemia

- Potentially a complication of IMA and internal iliac occlusion at time of procedure
- High index of suspicion
- Early flex sig or exploratory laparotomy



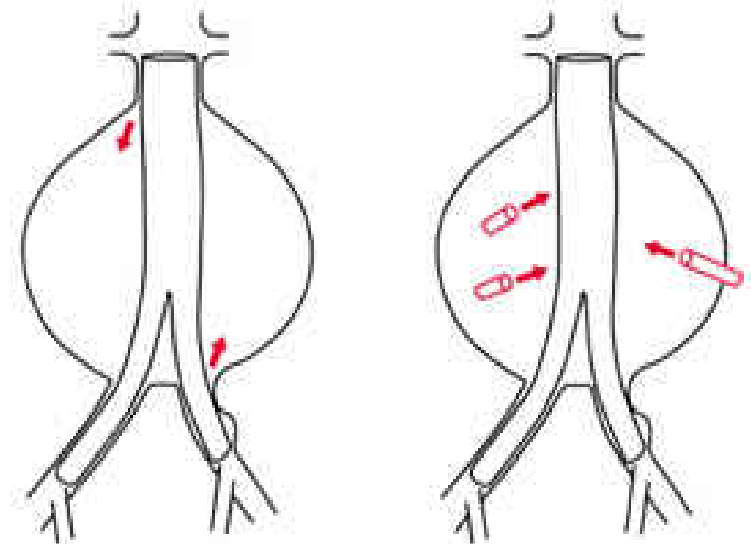
Late Complications of EVAR

Endoleak

A condition associated with endoluminal vascular grafts defined by the persistence of blood flow outside the lumen of the endoluminal graft but within an aneurysm sac or adjacent vascular segment being treated by the graft

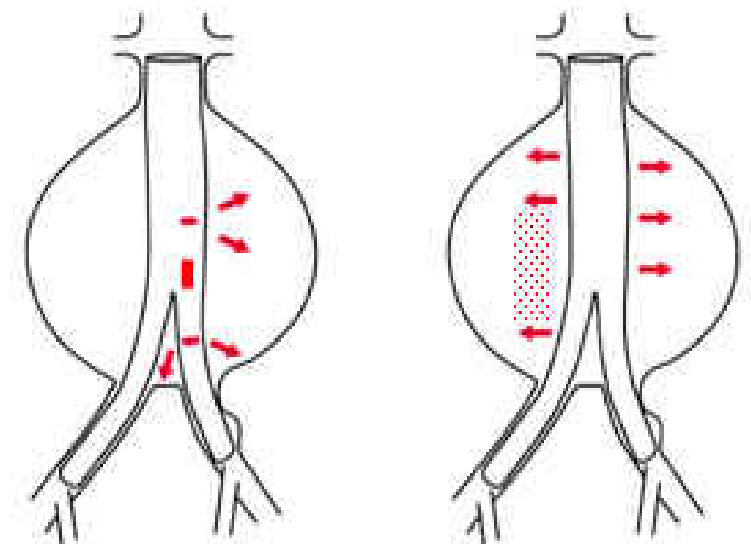
Endoleak

- **Type I Endoleak**
 - Proximal or distal attachment
- **Type II Endoleak**
 - Retrograde branch flow
- **Type III Endoleak**
 - Structural defect or junction
- **Type IV Endoleak**
 - Trans-graft “blush”



Type I

Type II



Type III

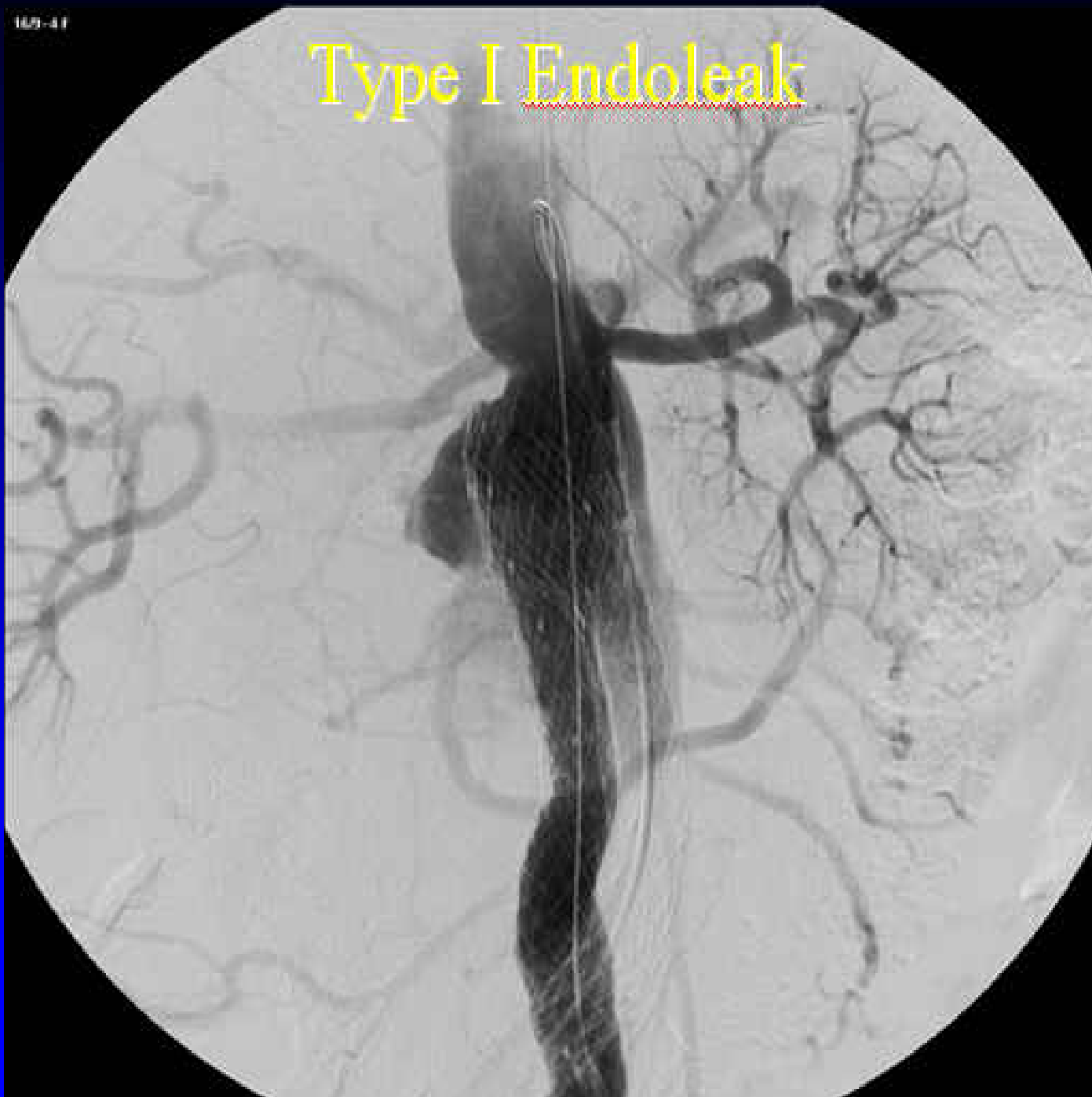
Type IV

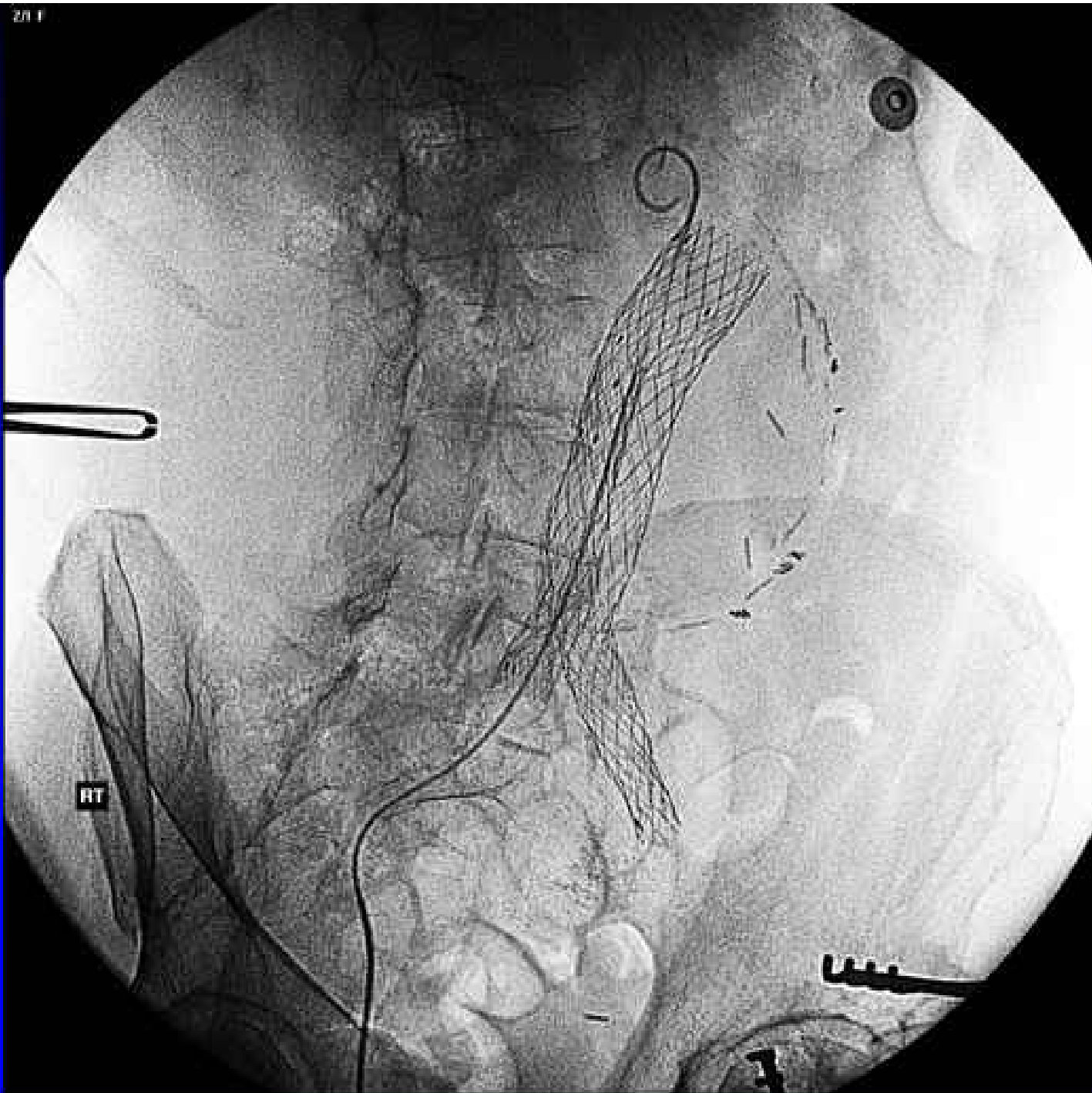
Management of Endoleak

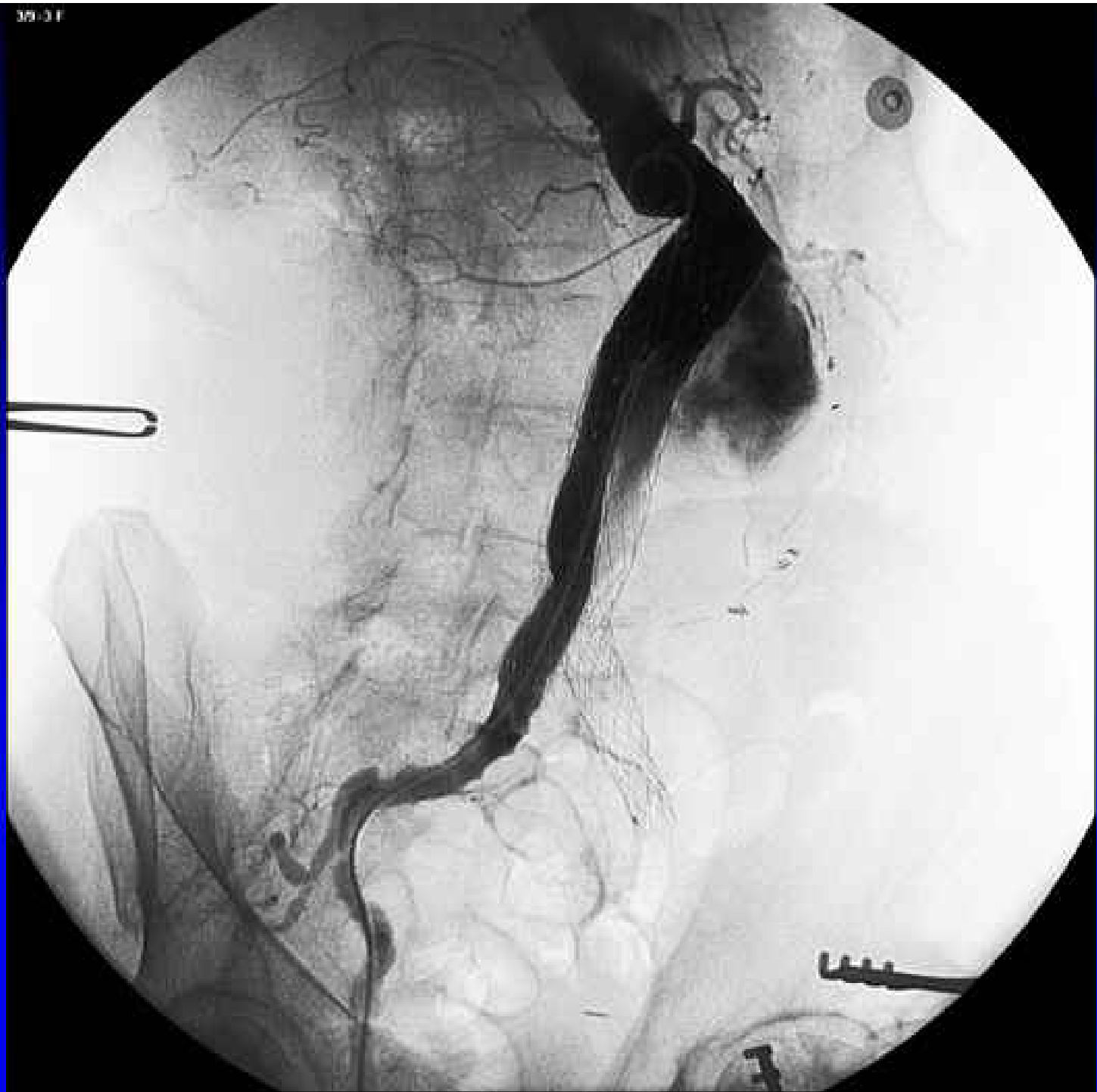
- Type I or III: Correction by further endoluminal graft procedure or surgery
- Type II:
 - Conservative (observation, with monitoring by repeat imaging)
 - Embolization
 - Conversion to open repair of aneurysm
- Type IV: No therapy required

10.9-41

Type I Endoleak



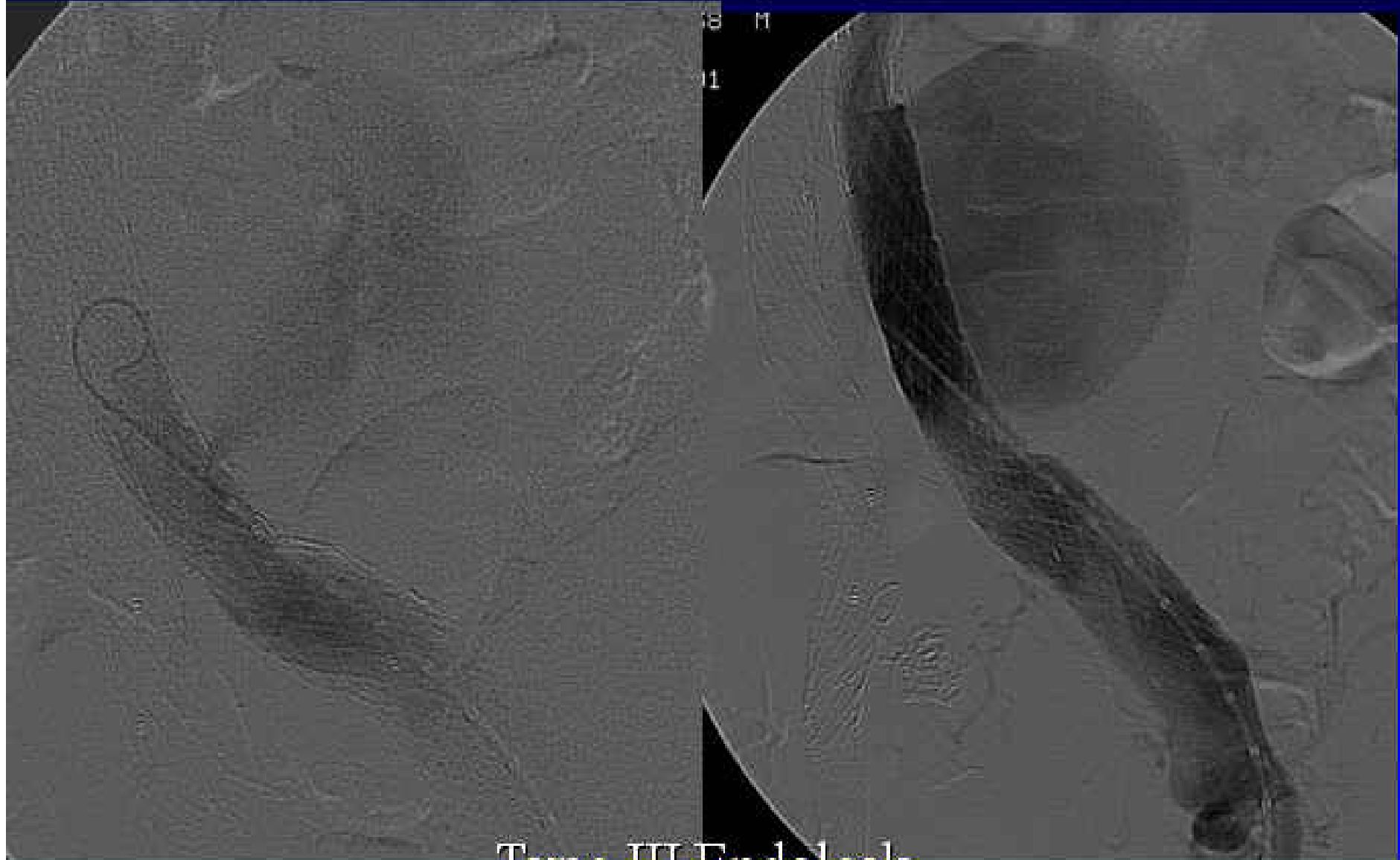








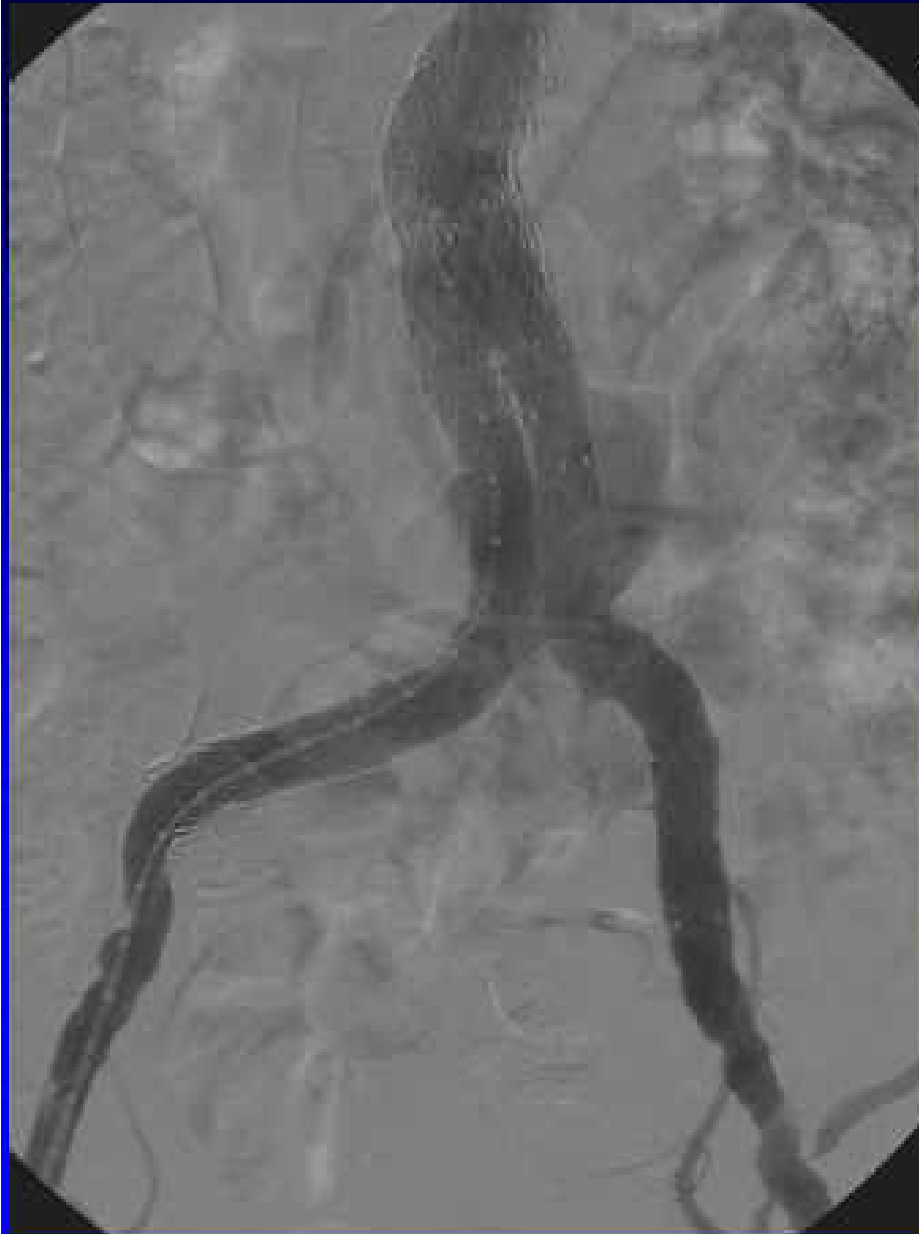
Late Graft Failure



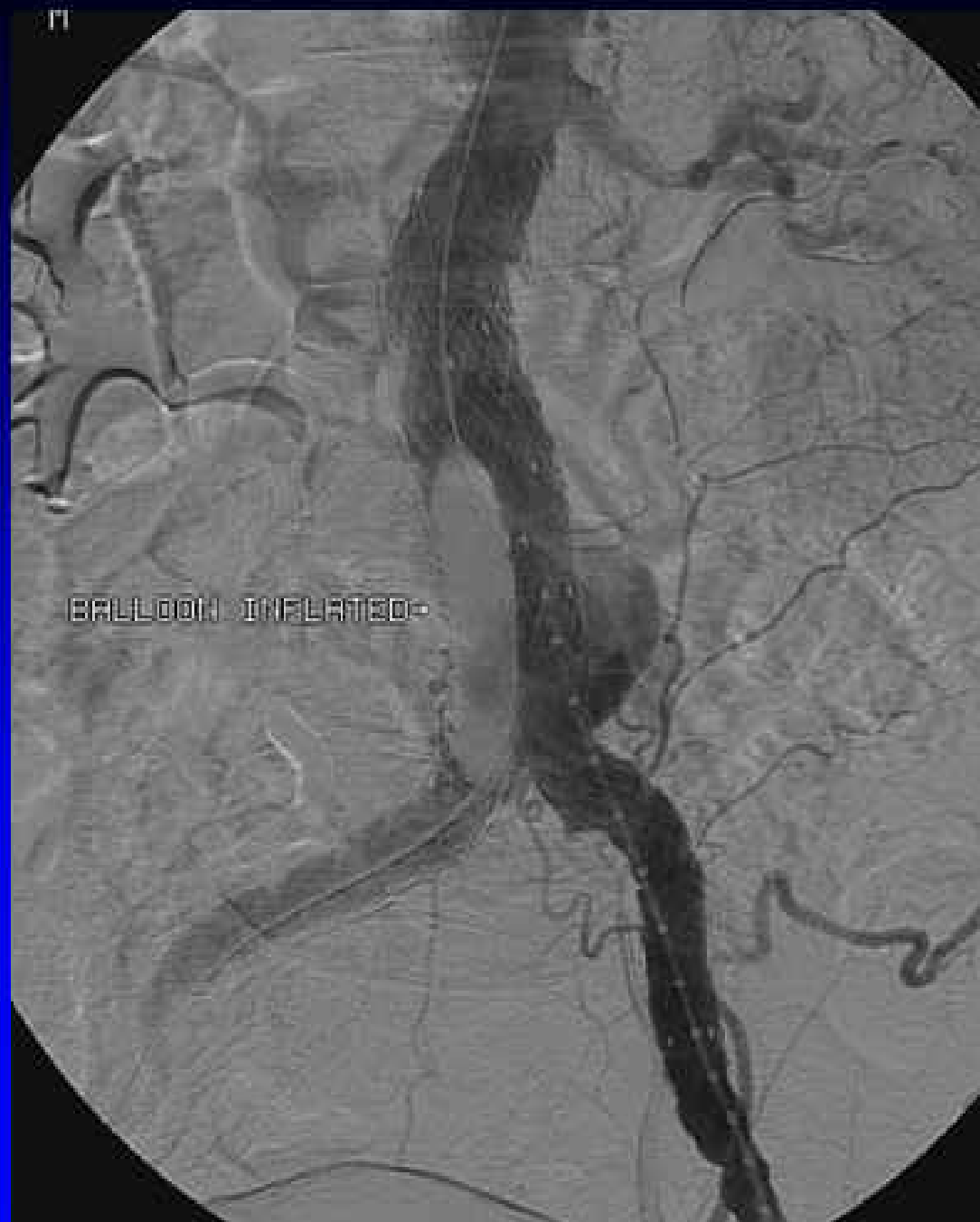
Type III Endoleak



Late Type III Endoleak



Location of Endoleak?



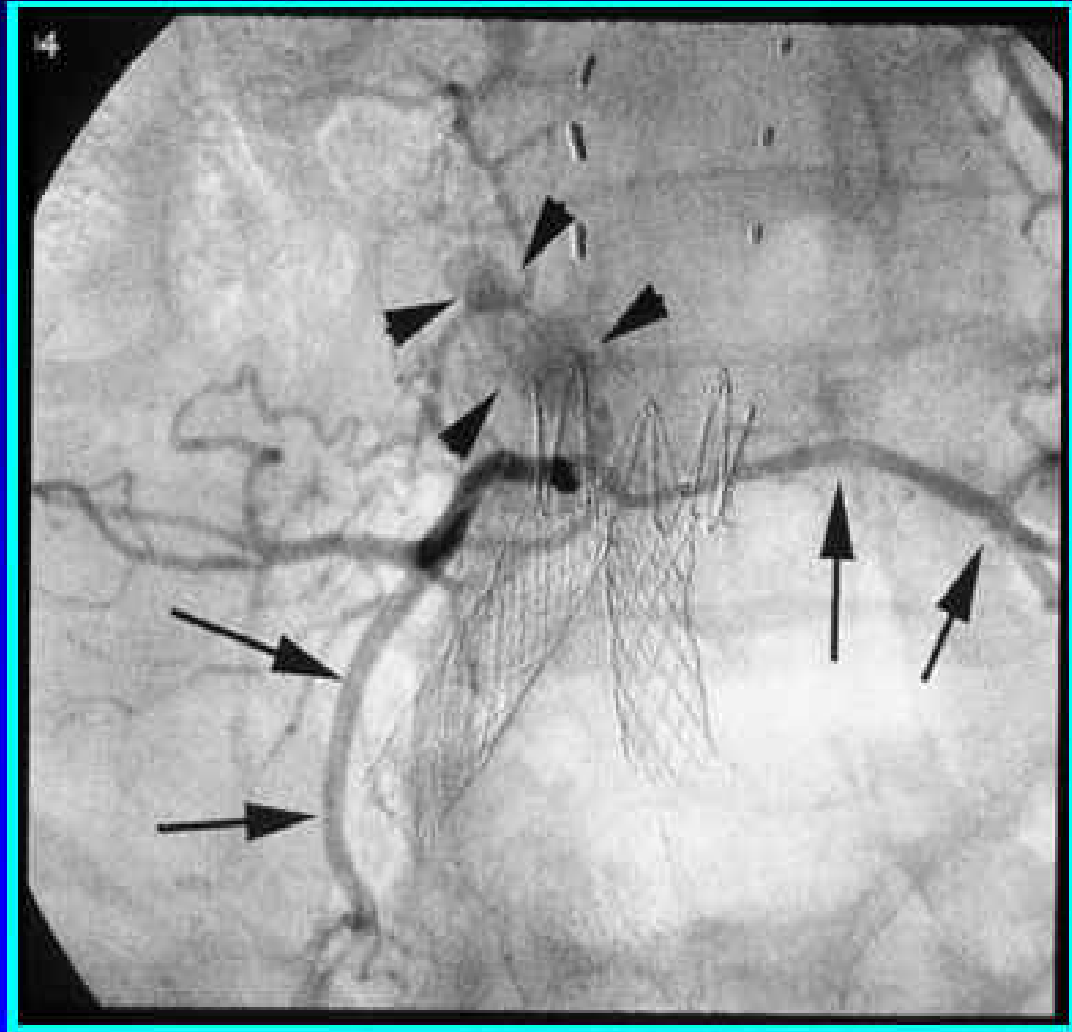
Following Endovascular Repair



Endoluminal Stent-Grafts

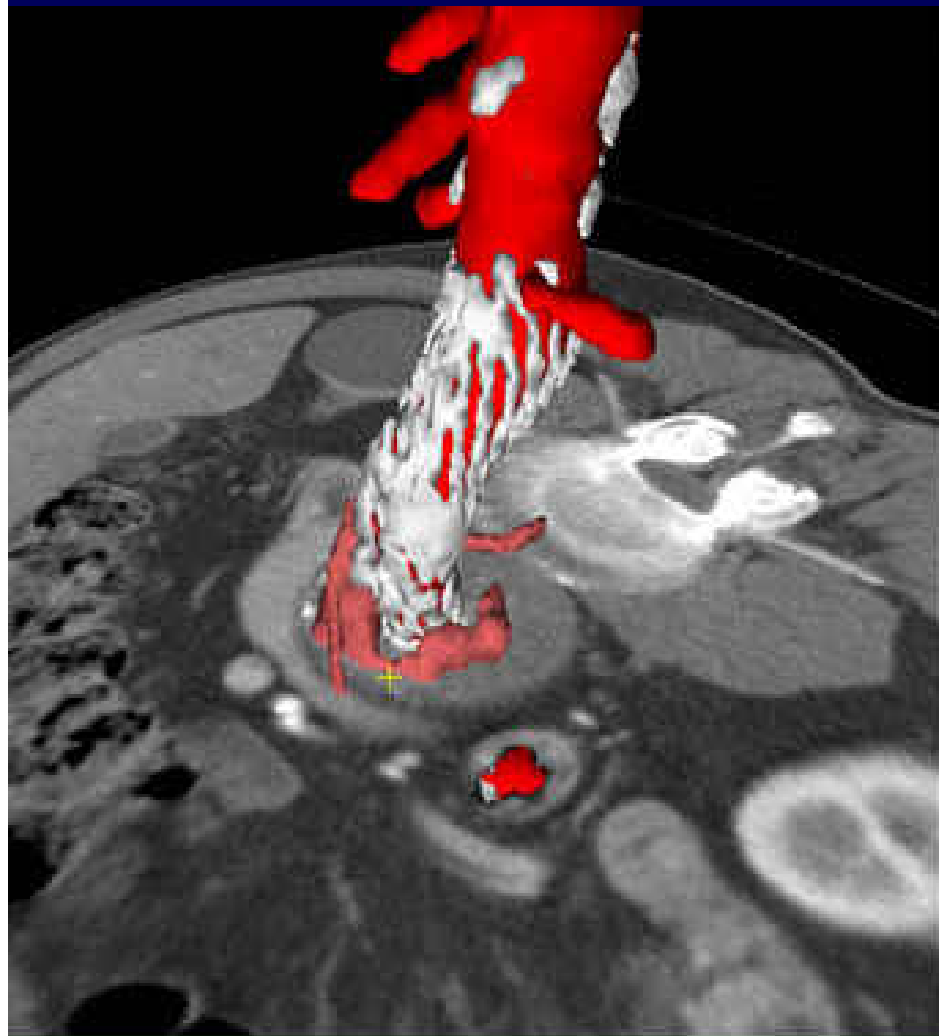
“What we call progress is the exchange of one nuisance for another”

Havelock Ellis



Type II Endoleak

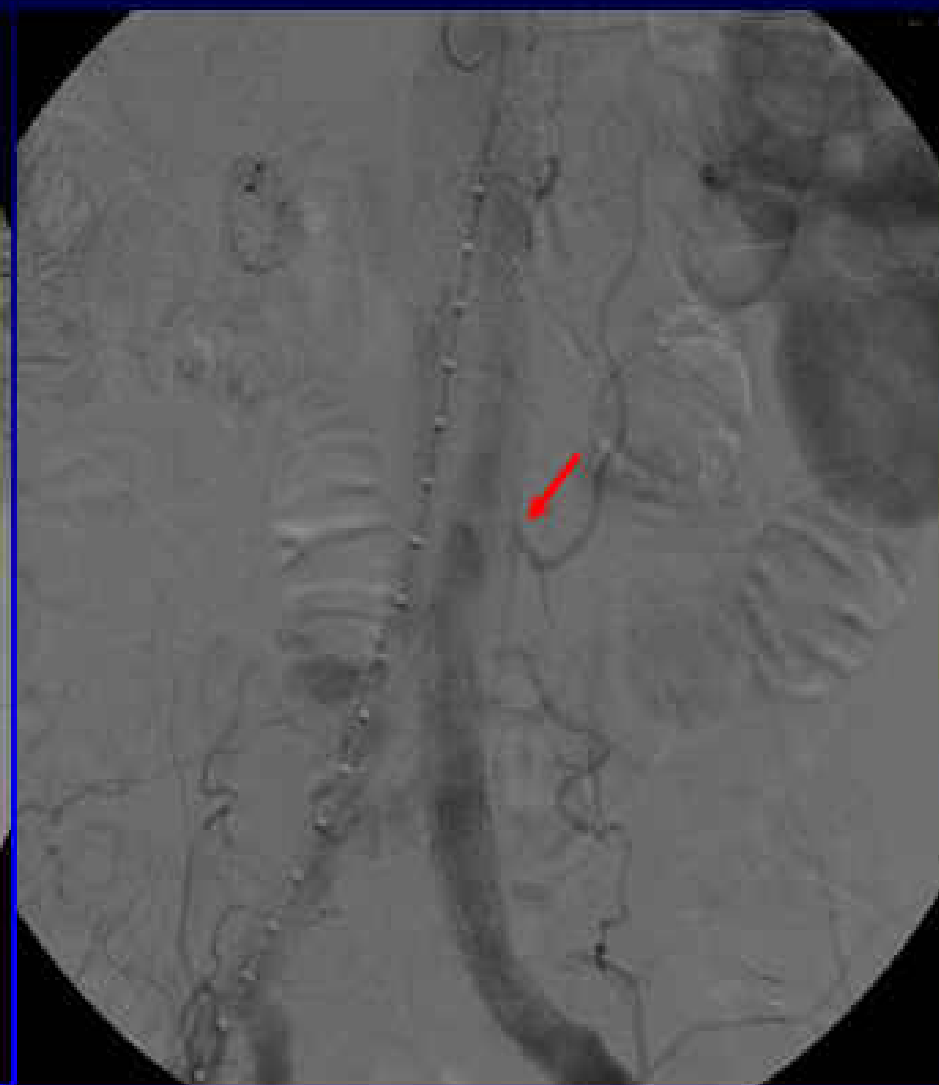
Endoleak: 2D + 3D Analysis

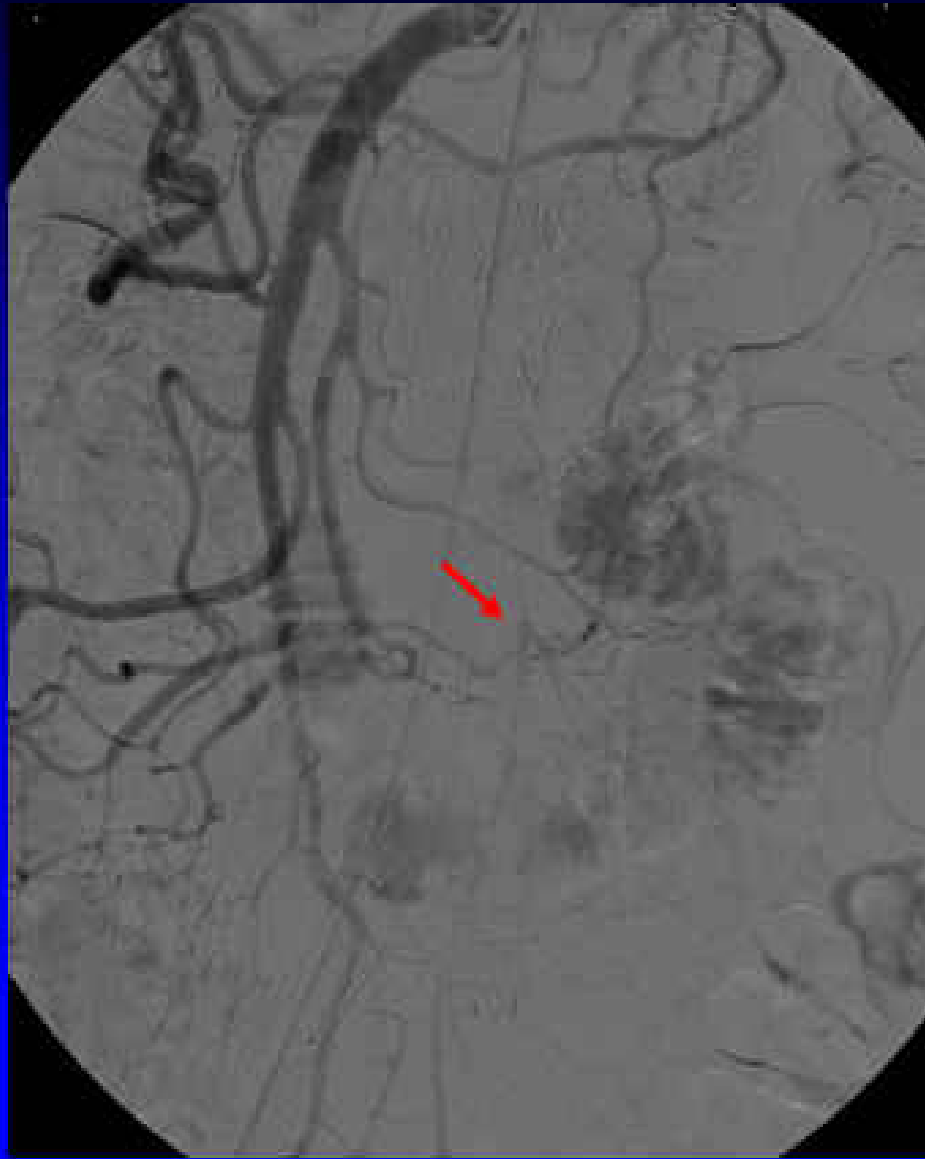


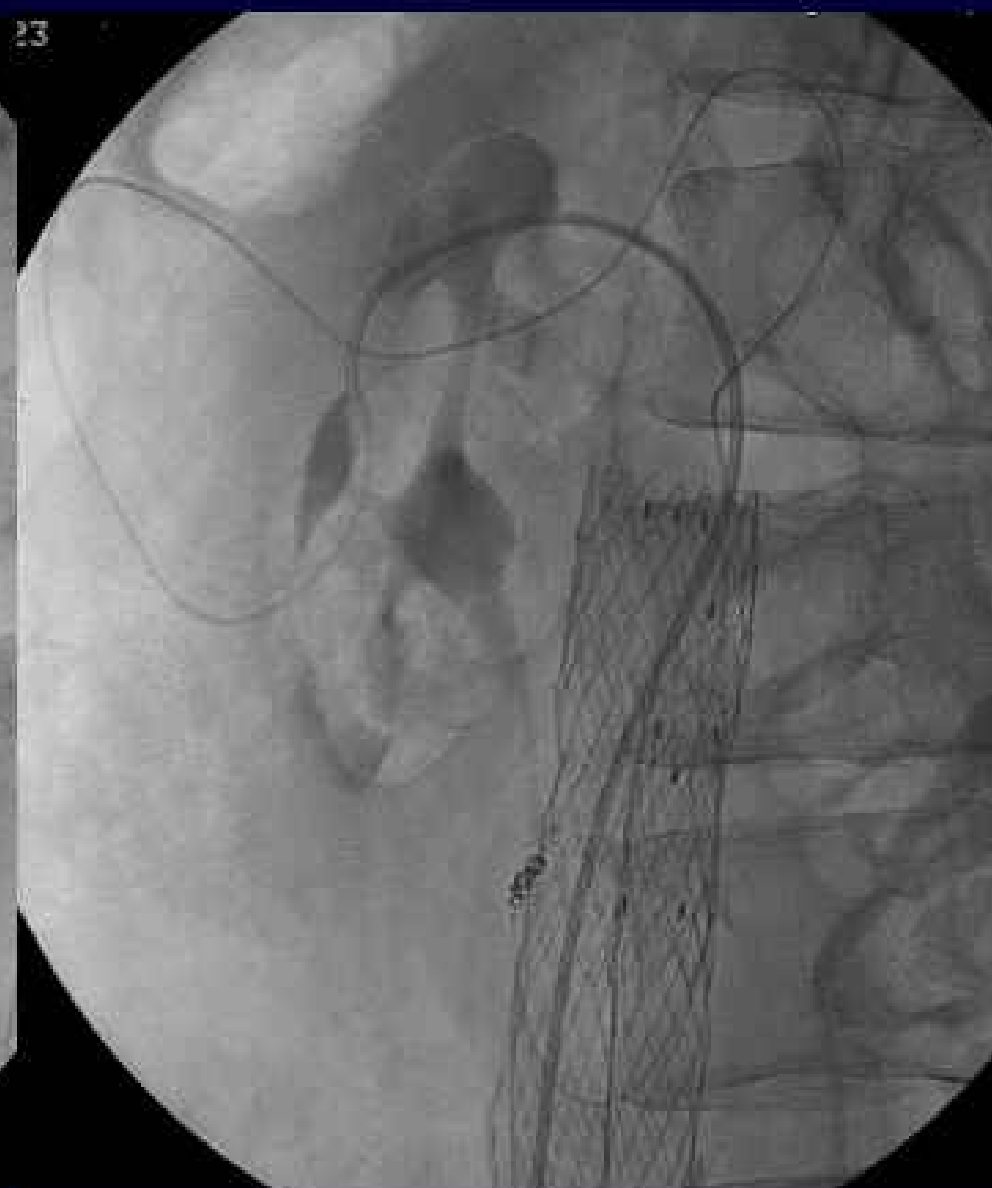
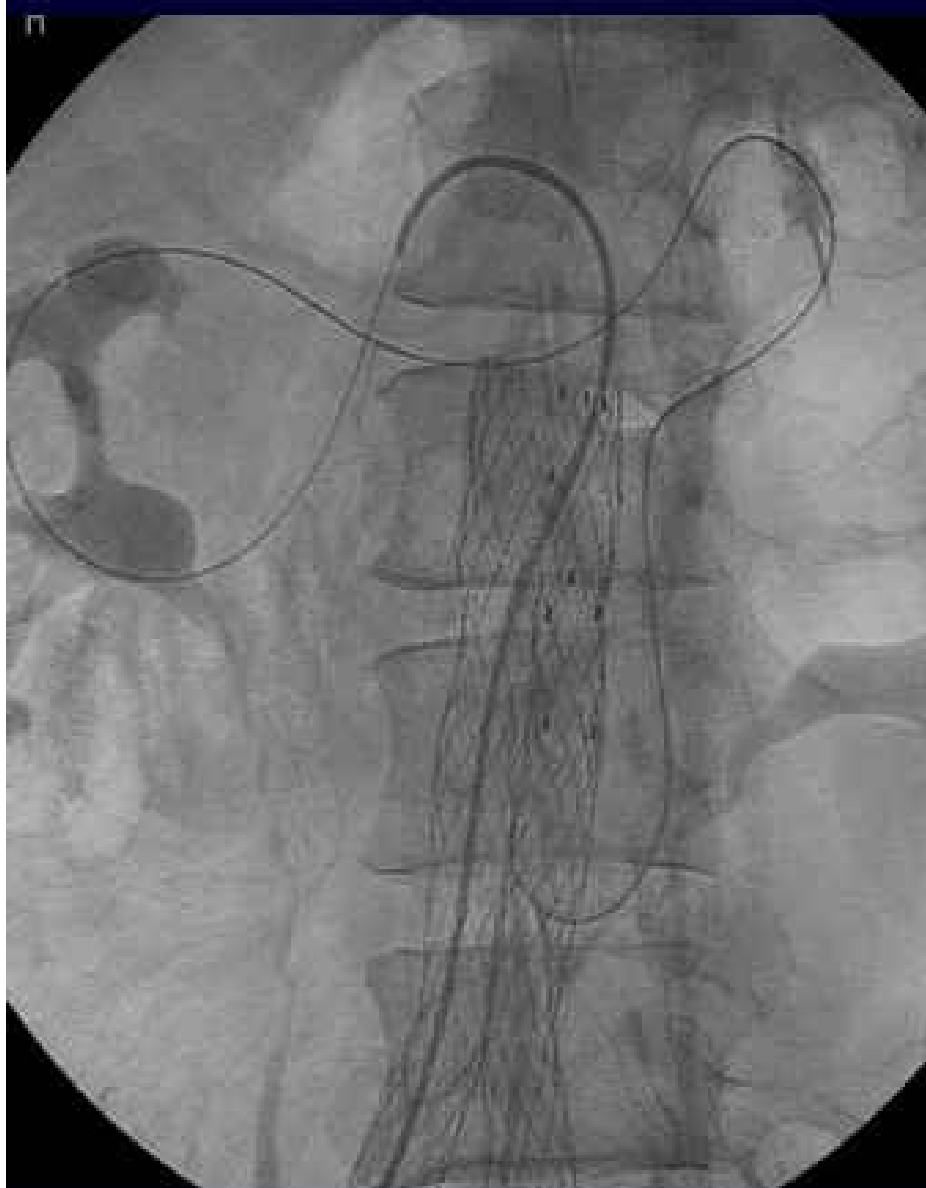
Type II Endoleak

- 72 year old male
 - 5 months s/p treatment of AAA with AneuRx stent graft device
 - Persistent endoleak noted on follow-up CT scans (anterior to graft in mid aortic area)



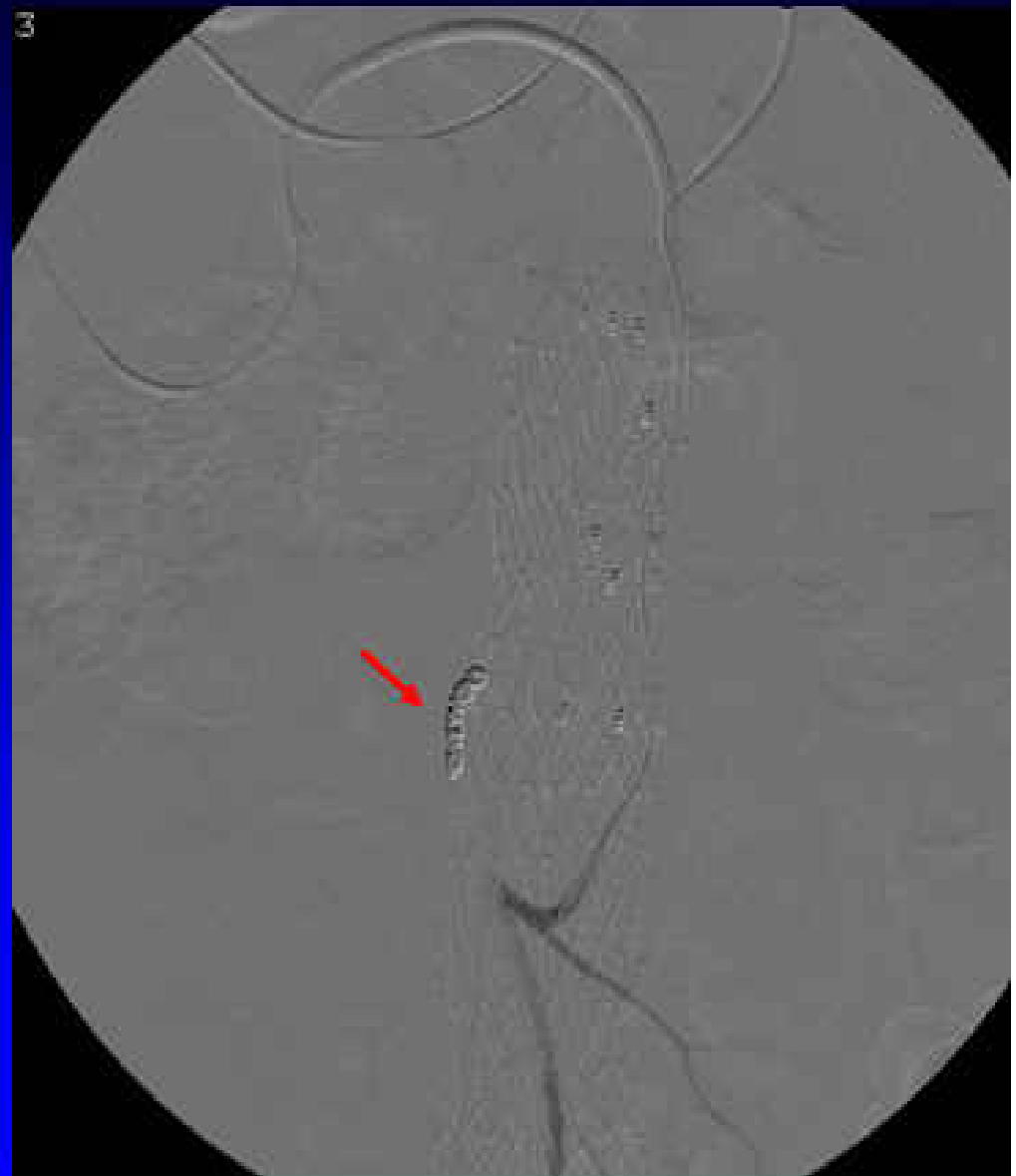




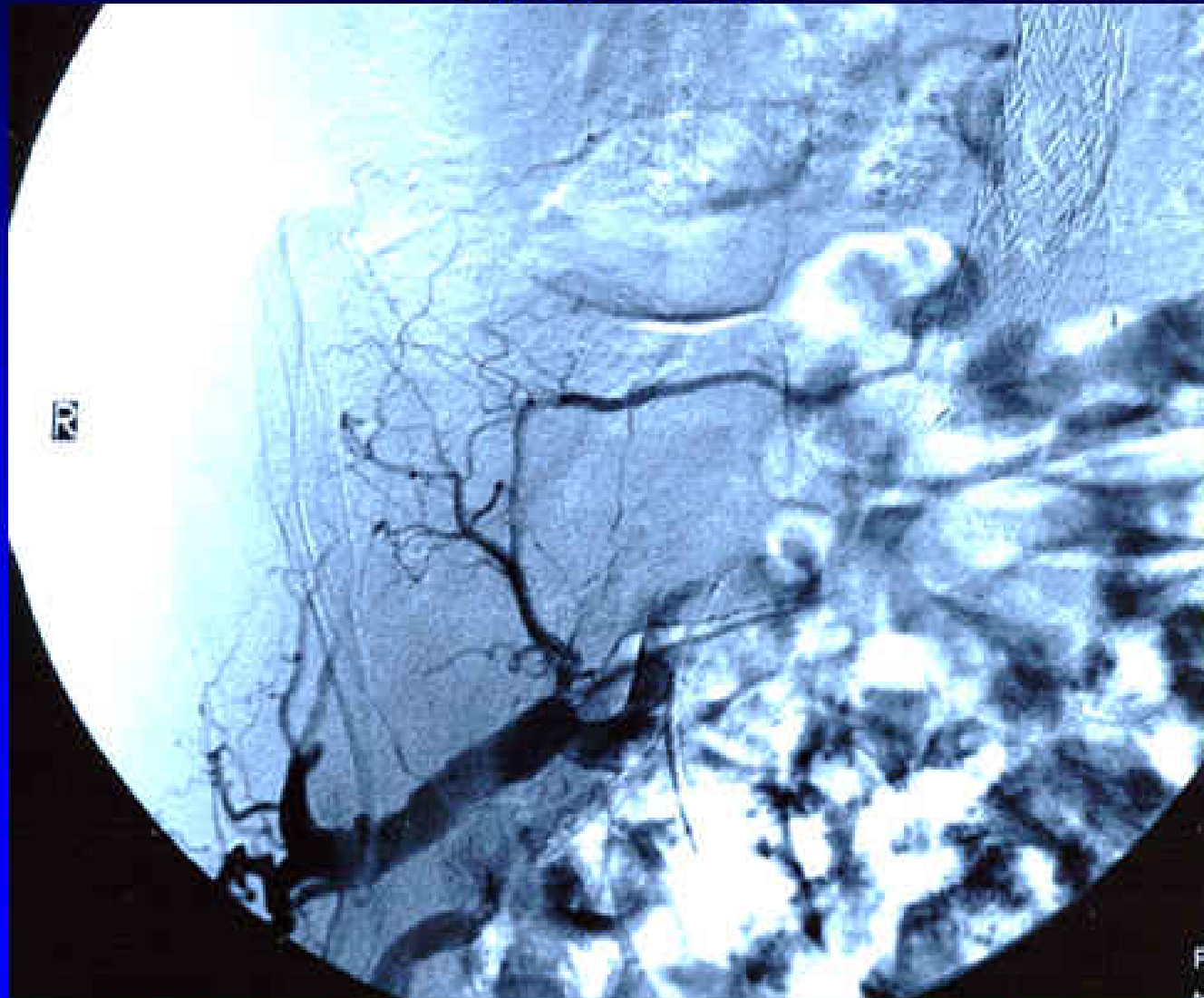


Type II Endoleak

- Equipment:
 - 6Fr IMA guide
 - 0.014" Choice PT wire
 - Transit catheter
 - .018" Vortex micro coils



Type II Endoleak – Lumbar Collaterals





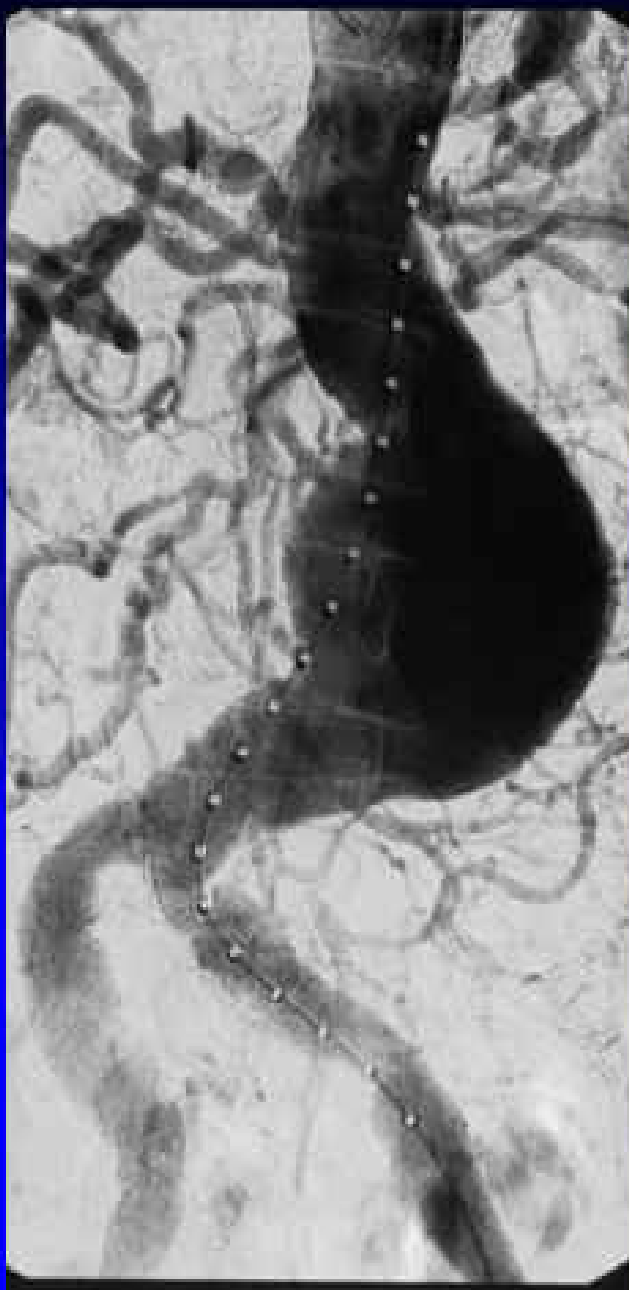


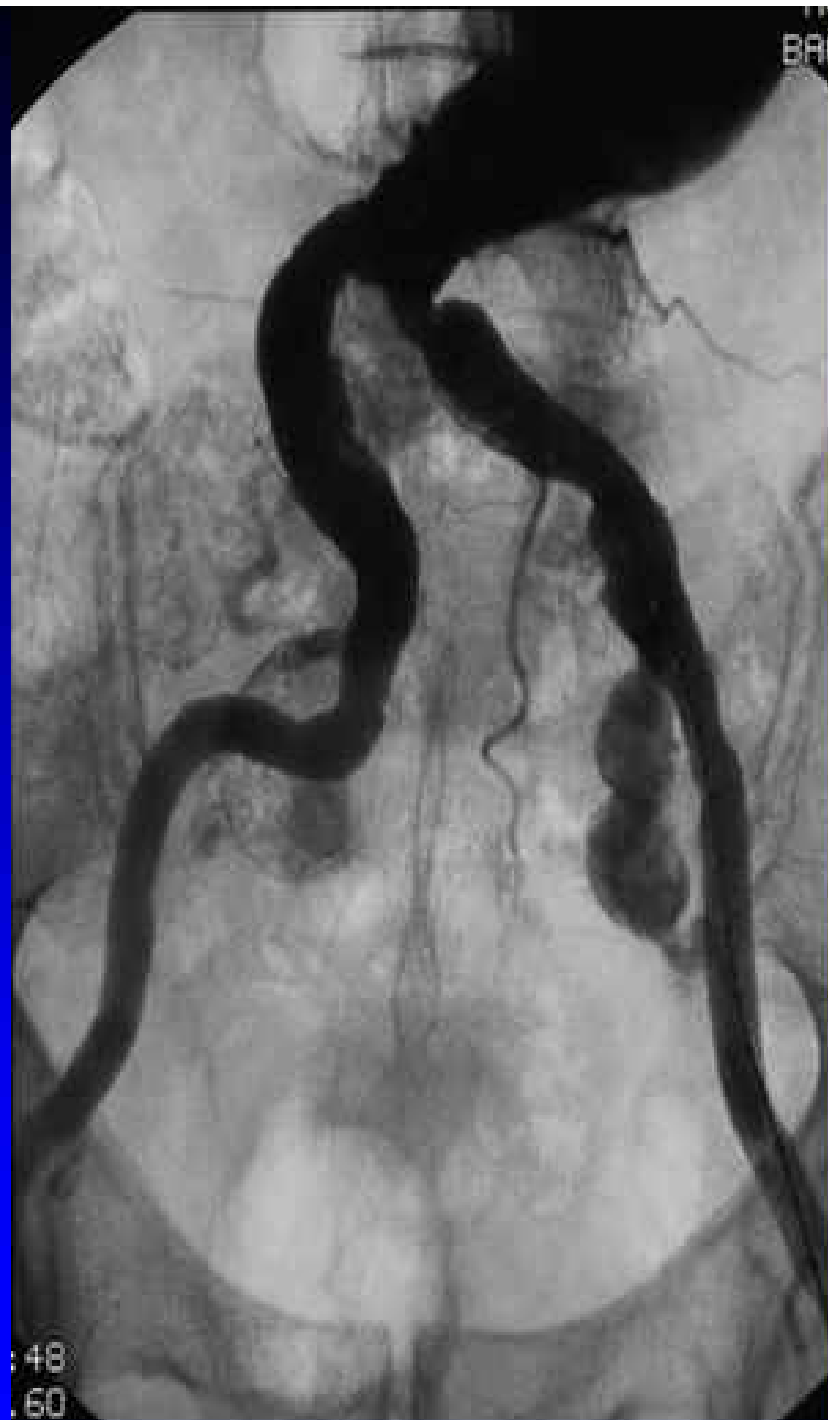
Coil embolization Type II Endoleak



Graft Limb Occlusion

- More common with the Guidant Ancure graft with unsupported limbs
- Very infrequent with current devices with fully supported limbs
- Usually results in acute limb ischemia or low level claudication symptoms





AVERA 1



Imaging

- F/U CT @ 1 month – okay
- F/U CT @ 7 months – demonstrated compromise of left iliac limb angiography

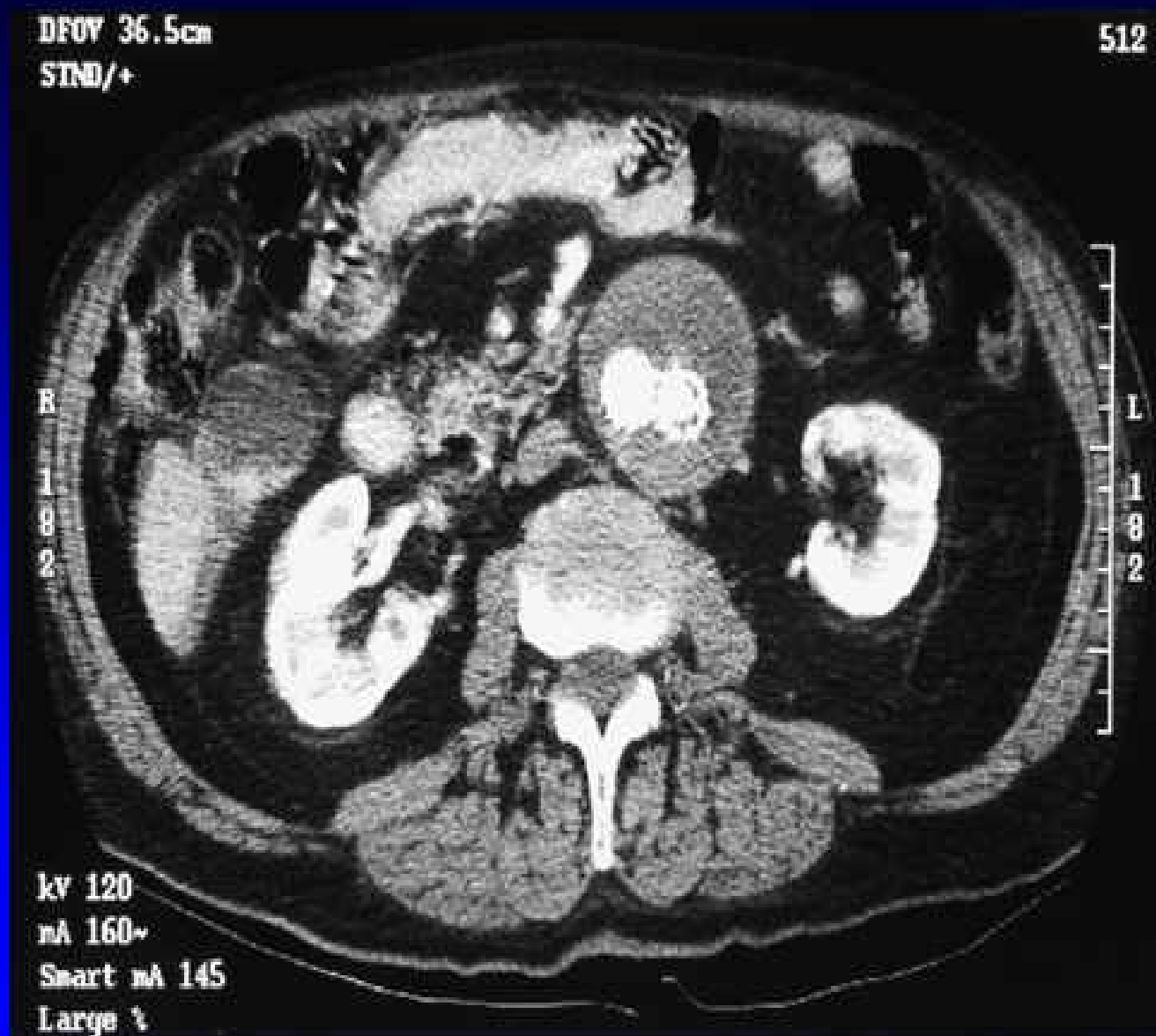
DFOV 36.5cm
STND/+

512

R
1
8
2

L
1
8
2

kV 120
mA 160~
Smart mA 145
Large 1



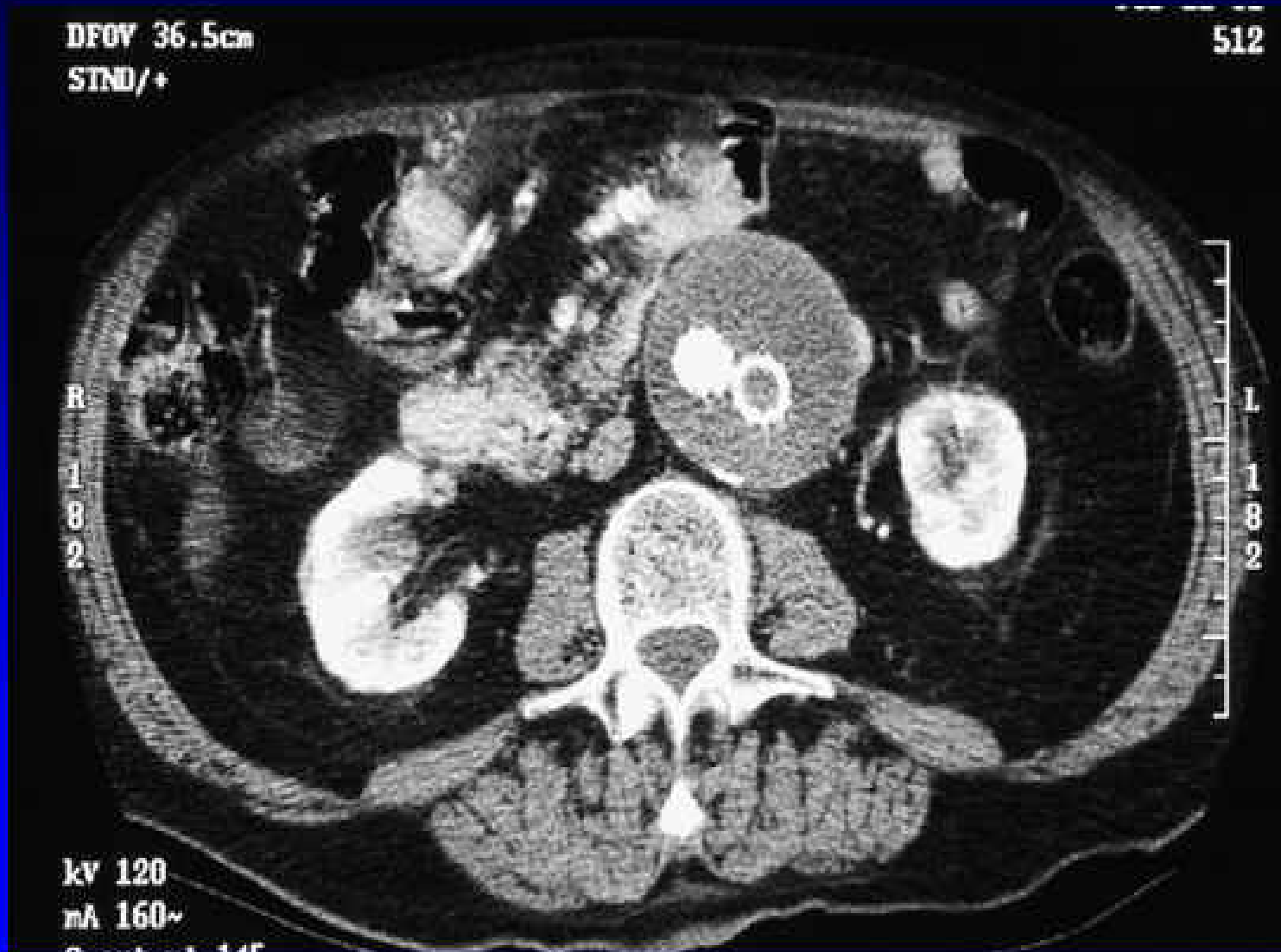
DFOV 36.5cm
STND/+

512

R
1
8
2

L
1
8
2

kV 120
mA 160~
Scout 145





Management

- Thrombolytic therapy and/or mechanical thrombectomy to remove thrombus
 - BioCardia Morph catheter can be used to gain contralateral access over flow divider and allow for placement infusion catheter
- Treatment of underlying hemodynamic problem
 - Compression/kinking of graft limb
 - Dissection iliac artery beyond limb





Summary

- Complications following EVAR are much less common with increasing operator experience and newer generation of devices
- Access related complications remain a significant issue and appropriate patient selection and pre-procedure planning critical
- Lifelong monitoring for late complications (endoleak, graft migration, graft failure) a must