

Endovascular Abdominal Repair: Technical Tips to Achieve Best Results and Avoid Disaster

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Presenter Disclosure Information

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Within the past 12 months, the presenter or their spouse/partner have had a financial interest/arrangement or affiliation with the organization listed below.

Company Name

*QuantumCor
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Relationship

*Major Stock Holder/Medical Director
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Patents -- *RF, Snares, Wires, Balloon Catheters, Covered Stents, Devices for Arterial Venous Connection, Devices for LV and RV Closure*



Aneurysms

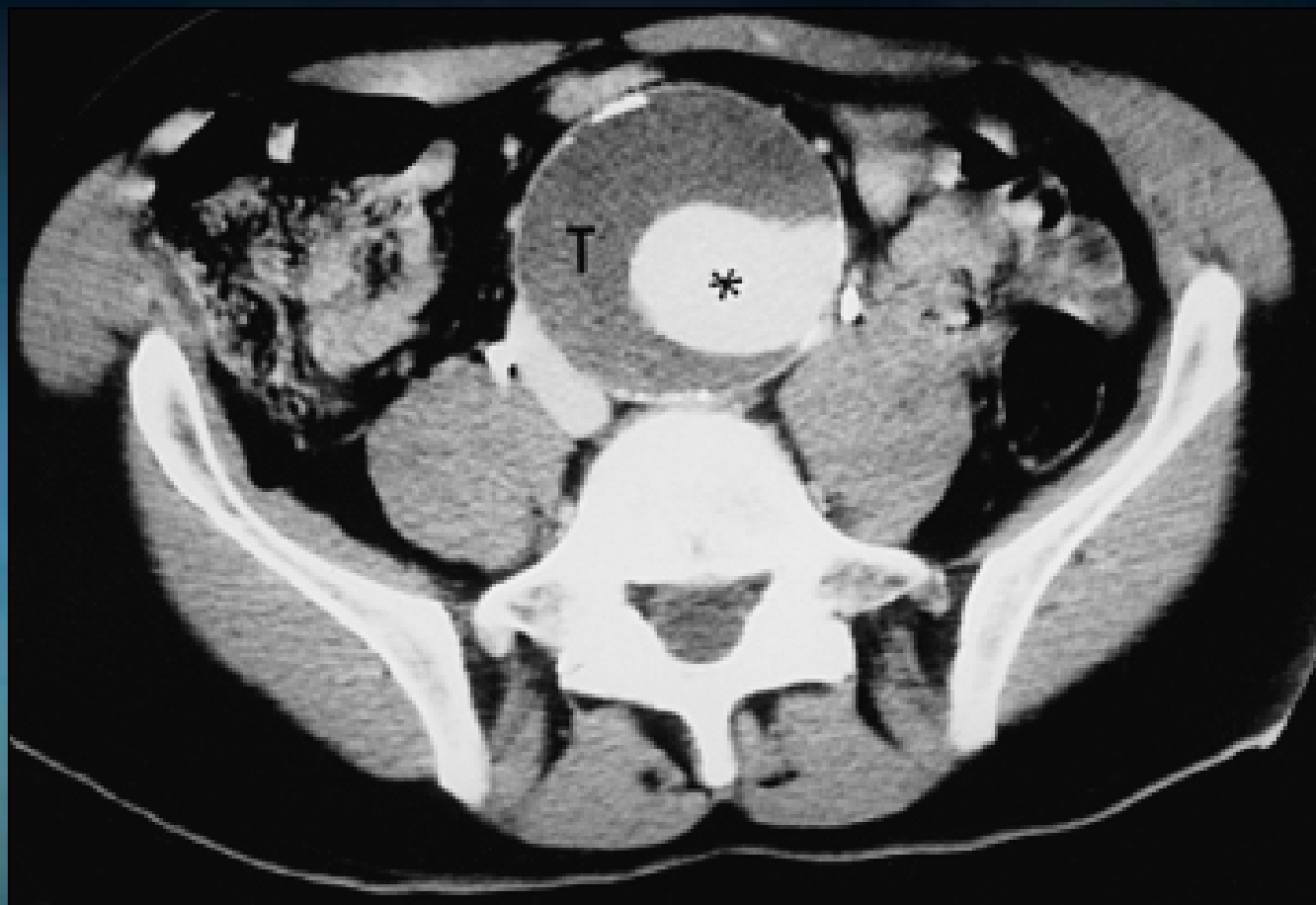
- *aneurysm is derived from the Greek word aneurysma meaning “a widening”*
- *an aneurysm is defined as a permanent localized dilation of an artery having at least a 50% increase in diameter compared with the expected normal diameter*
- *dilation <50% is termed ectasia*



Aneurysms History

- *A description of traumatic aneurysms of the peripheral arteries in the Ebers Papyrus (2000 B.C.)*
- *Antyllus in 2nd century AD recommended ligating the artery above and below and evacuating the contents*
- *Brachial artery false aneurysms common complication of blood letting*





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Figure 100-1 CT scan of abdominal aortic aneurysm shows contrast-filled lumen (*) surrounded by thrombus (T) within the aneurysm sac.

Aneurysms

- *Can occur in any artery*
- *Most often in infrarenal abdominal aorta, accounting for 80% of all aneurysms*



Aortic Aneurysms

- *13th leading cause of death in the United States*
- *15,000 deaths from rupture per year*



Aortic Aneurysms

- *Incidence has increased fourfold 9/1000 to 37/1000*
- *Same time period deaths from stroke and MI decreased 30-40%*



Aortic Aneurysms

- *1 in 10 men by 75 years of age will have an abdominal aortic aneurysm by ultrasound*
- *Women > 80 incidence approaches that in men*
- *Women with aneurysms are more likely to rupture and die than aneurysms in men*



Aortic Aneurysms

- *10% - 15% of patients with aneurysms have a family history of aneurysms.*
- *Aneurysms can be found in up to 30% of siblings of patients with aneurysms*



Aortic Aneurysms

- *Most are asymptomatic*
- *Best screen is abdominal ultrasound*
- *Natural history is to enlarge and rupture*
- *50% of untreated aneurysms will die of rupture*

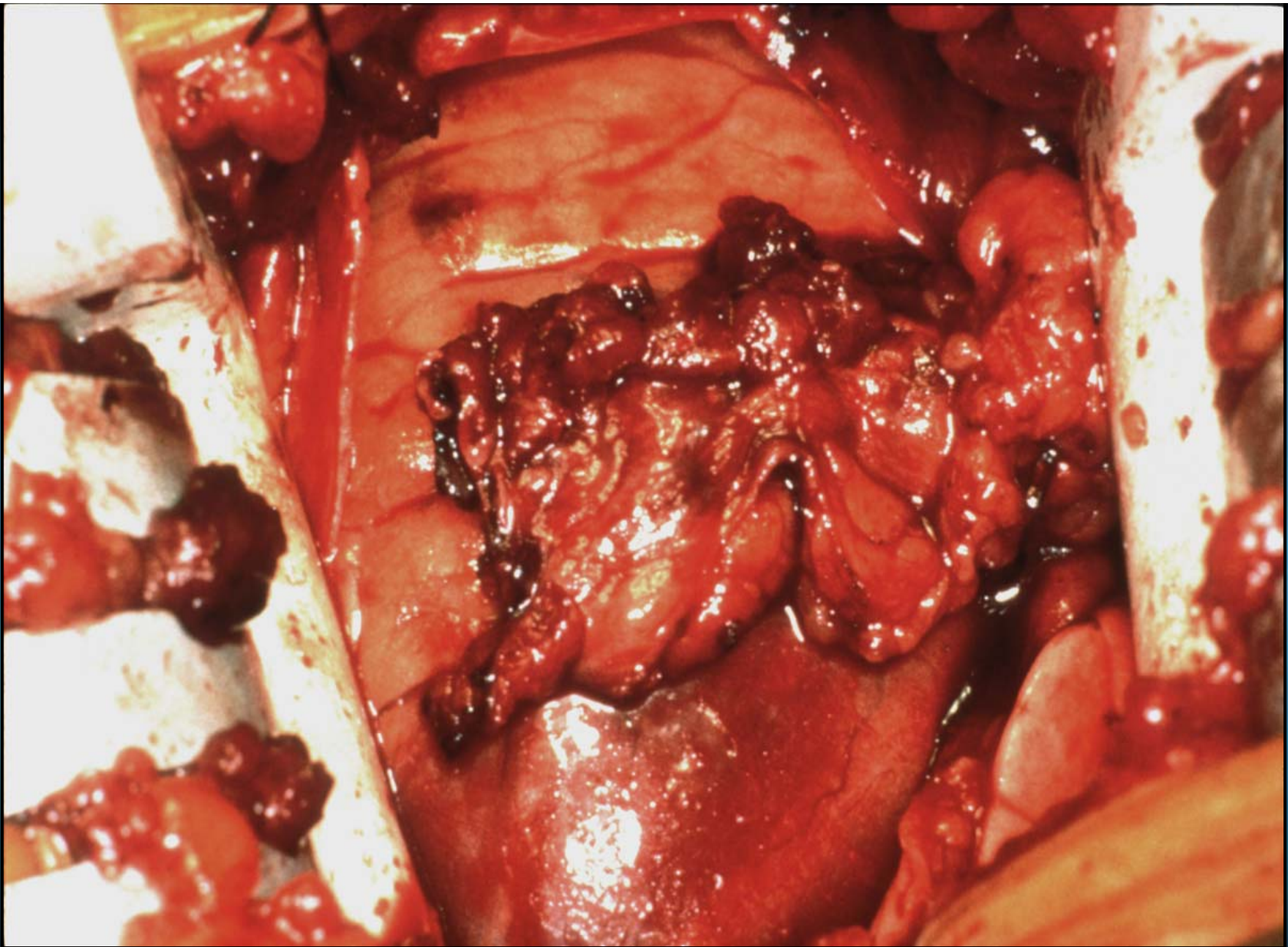




Abdominal Aortic Aneurysm

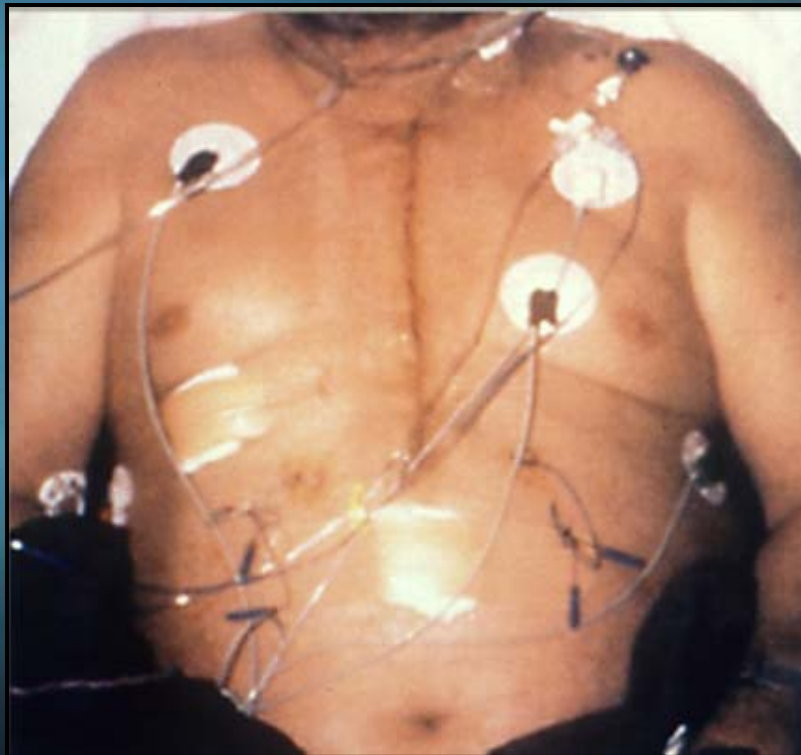
- *Proclivity for lower extremities aneurysms*
- *3.5% have other aneurysms (femoral/popliteal)*
- *Likewise if peripheral aneurysm look for AAA*





Minimally Invasive

CABG



MIDCAB™



Aneurysms

Minimally Invasive Approaches

- *Thrombose with electric current between needles stuck into the vessel 1832-1930's*
- *1864 steel wires into the aneurysms (up to 26 yards)*
- *Wrap in cellophane (Einstein had this done in 1949 for a symptomatic AAA)*





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Figure 100-7 Transabdominal aortic aneurysm exposure, vascular clamps in place, incising the aneurysm.



Aneurysms

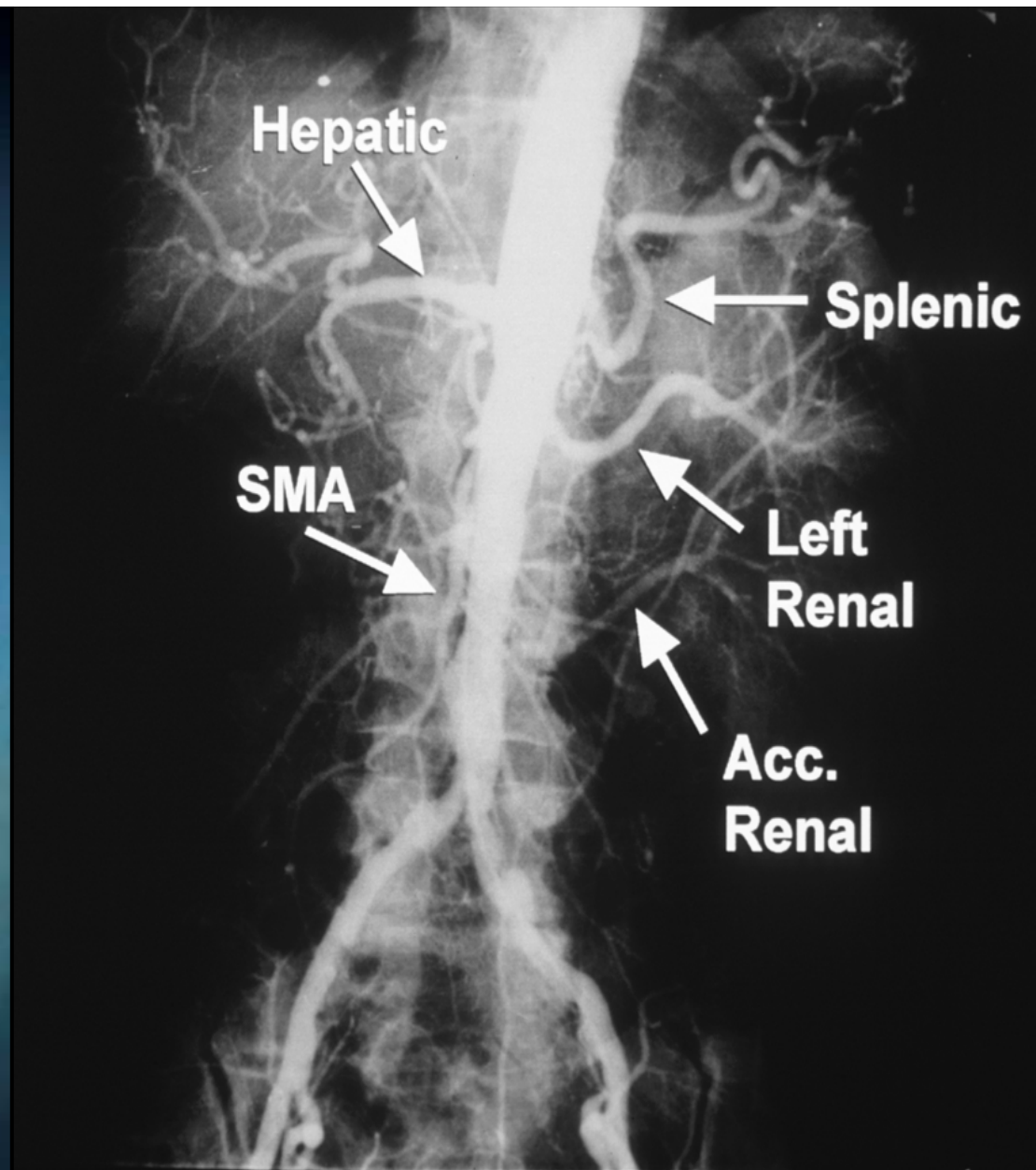
- *1st successful open aortic aneurysm repair was in 1951 by Norman Freeman using an autogenous iliac vein graft*
- *Charles Dubost used an aortic homograft to replace the aneurysm*

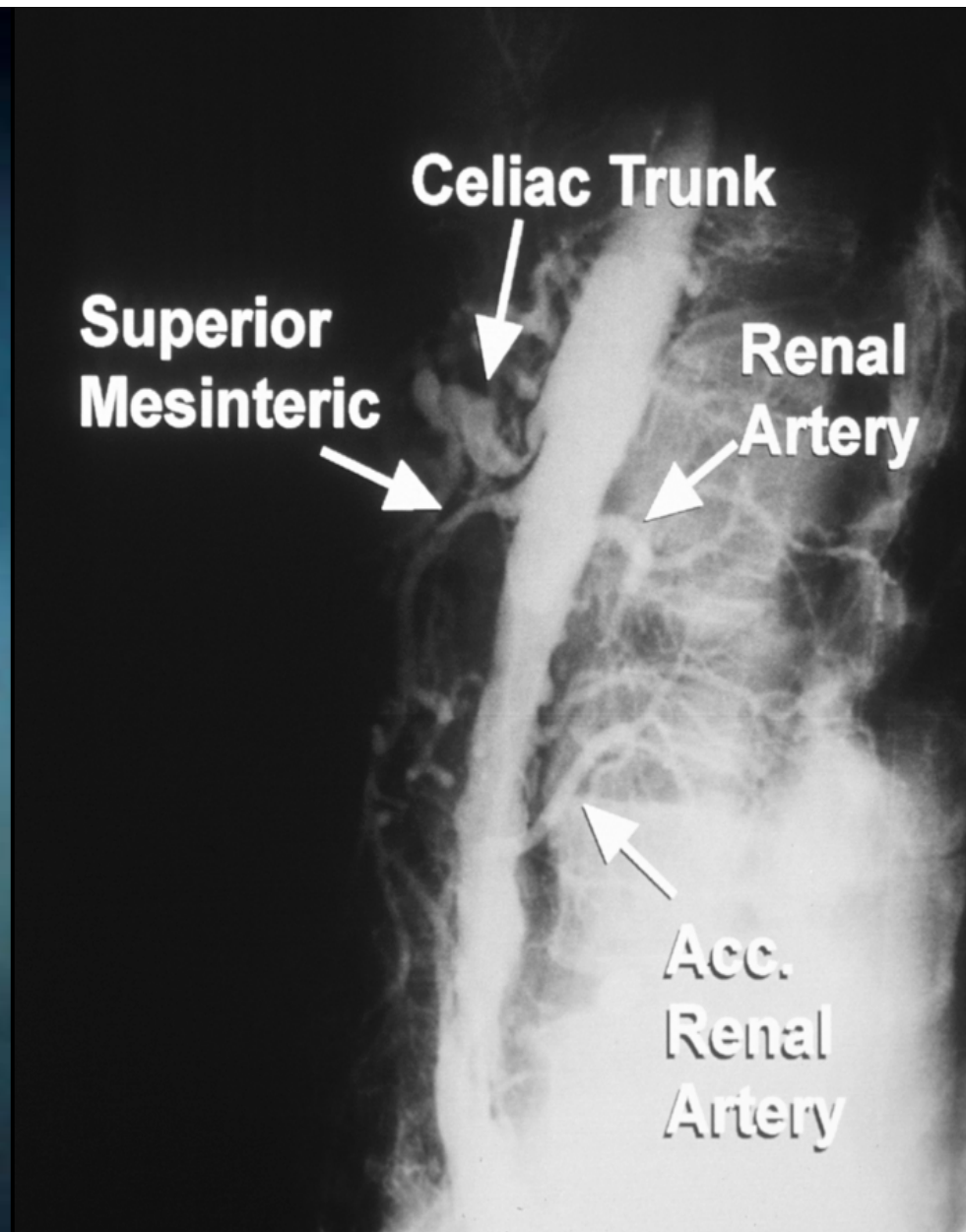


What You Need to Know to do about Peripheral Intervention

- *Know the disease*
- *Know the anatomy*
- *Know the patients' symptoms*
- *Know and understand the non-invasive testing*
- *Know the alternatives*
- *Know the anticipated results*
- *Known the potential risks*







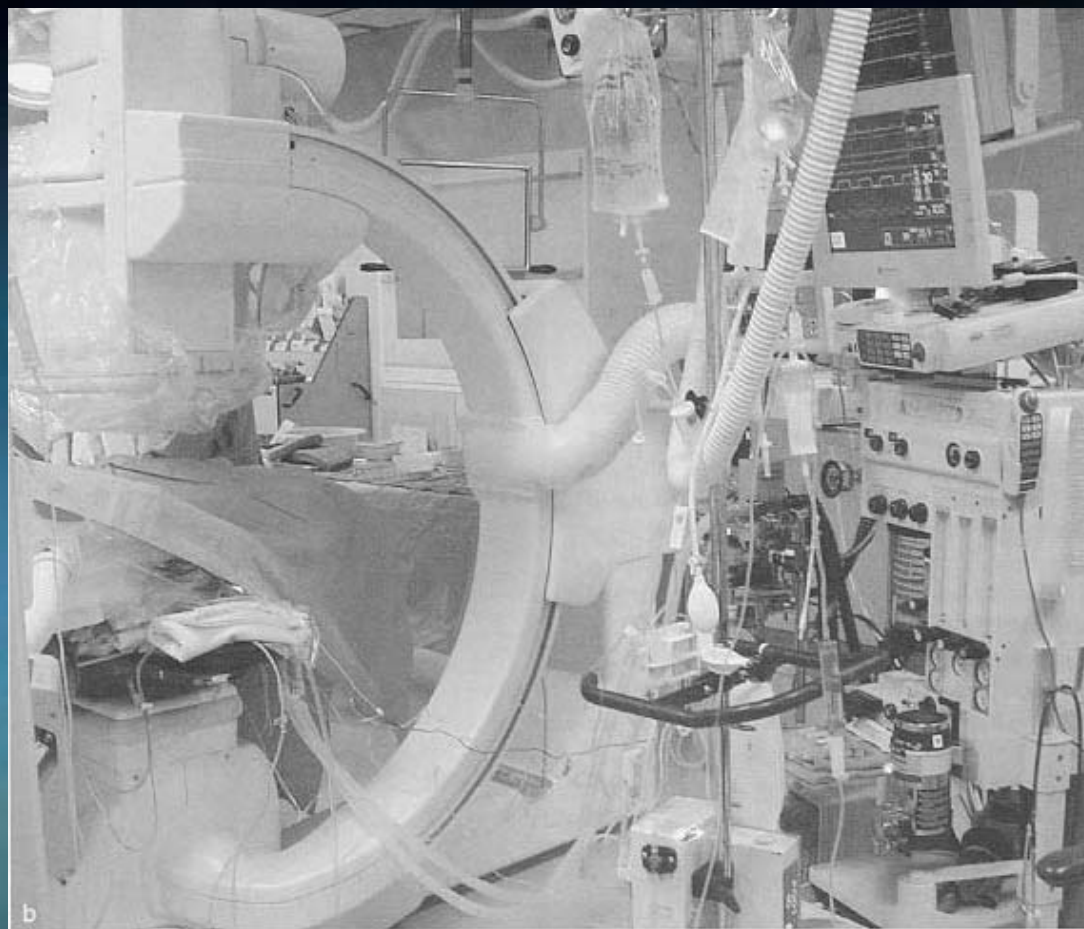


Fig. 5.3 Continued (b) The endovascular suite must be large enough to accommodate all the equipment needed to perform complex interventions.

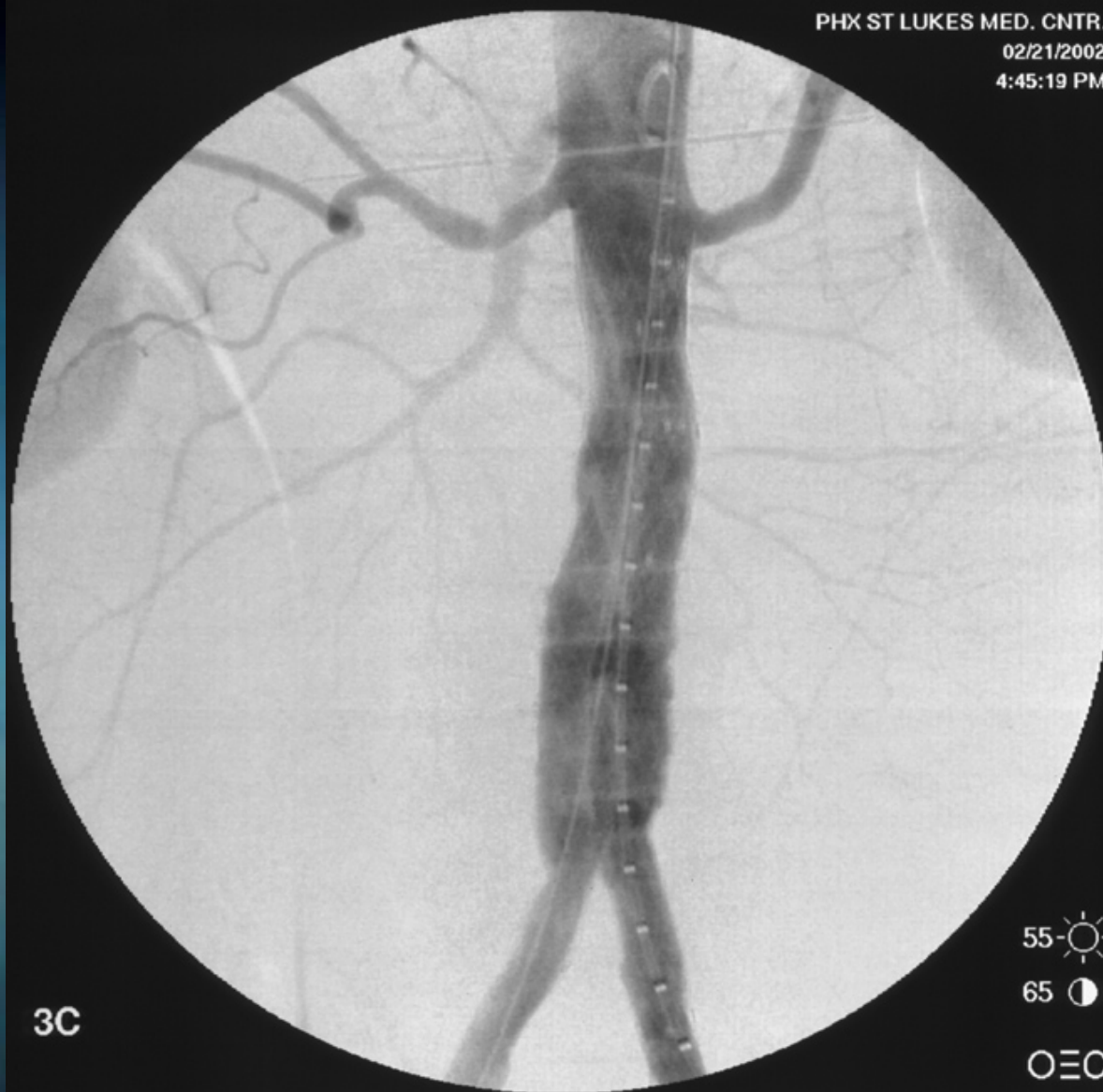
*Heuser, Biamino, Peripheral Vascular Stenting Second Edition,
2005 Taylor & Francis, an imprint of the Taylor & Francis group*



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Plan ahead

William Osler, 1907

R. Heuser



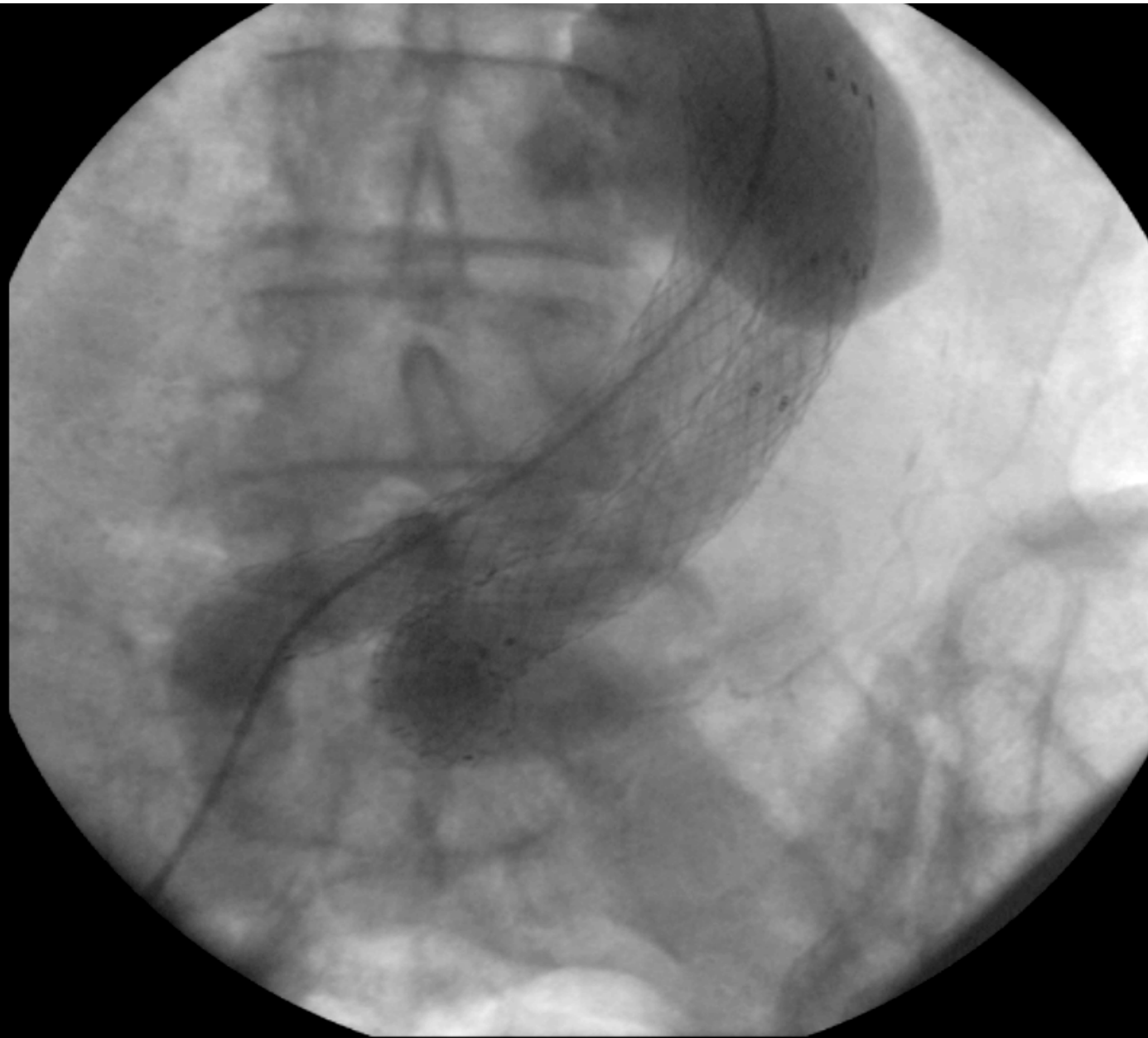


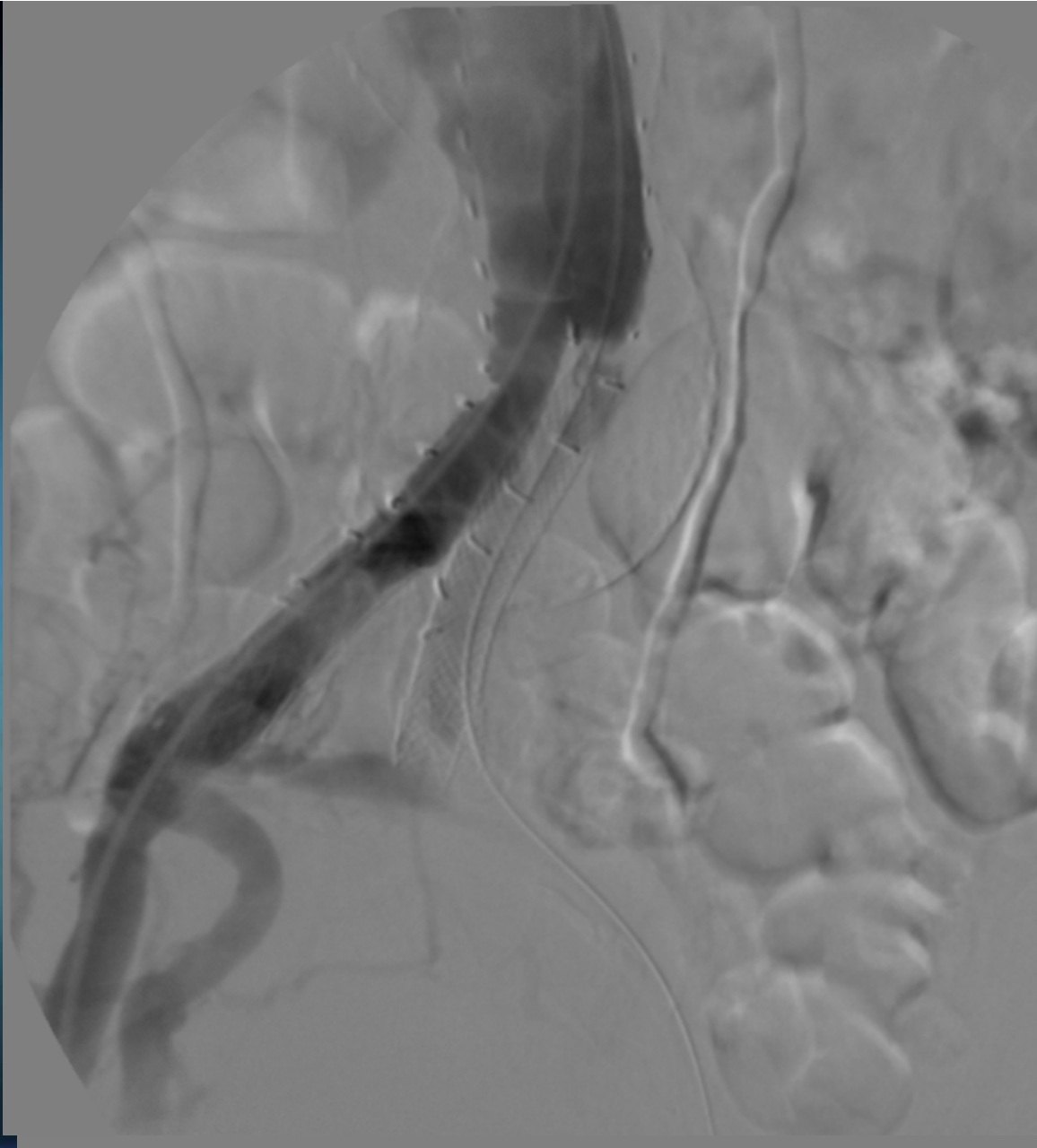
Endoluminal Stent-Graft Demonstrated Advantages

- *Minimally invasive surgery*
- *Reduced morbidity and ?mortality*
- *Less blood loss/need for transfusion*
- *Shorter hospital stay*
- *Quicker recovery time*

Patient Preferred Treatment







BUSINESS/FINANCIAL DESK | June 17, 2003, Tuesday

Medical Concern Will Halt Sales Of Artery Device Linked to Deaths

By MELODY PETERSEN (NYT) 746 words

Late Edition - Final , Section C , Page 1 , Column 5

ABSTRACT - Guidant Corp to stop selling device that helps treat weakened abdominal aorta after admitting it concealed thousands of problems linked to product; says 18,000 patients who already have device are safe because problems center on system used to insert it, not device itself; says it will continue to support those patients over years; group chairman Jay Graf says potential liability from dozen suits filed on behalf of patients who died or were injured by device is 'manageable' because product liability insurance will help pay costs (M)

*65 year-old man who
presents with left leg
claudication*



Past Medical History

- *Pulmonary Embolism with DVT 1957*
- *PTCA 1995*
- *Previous PTA Left Iliac Artery prior to ELG Placement for Abdominal Aortic Aneurysm 06/2000*
- *Total occlusion of Left limb of ELG with subsequent Right Limb Femoral-Femoral bypass 06/2001*
- *Continued tobacco abuse*

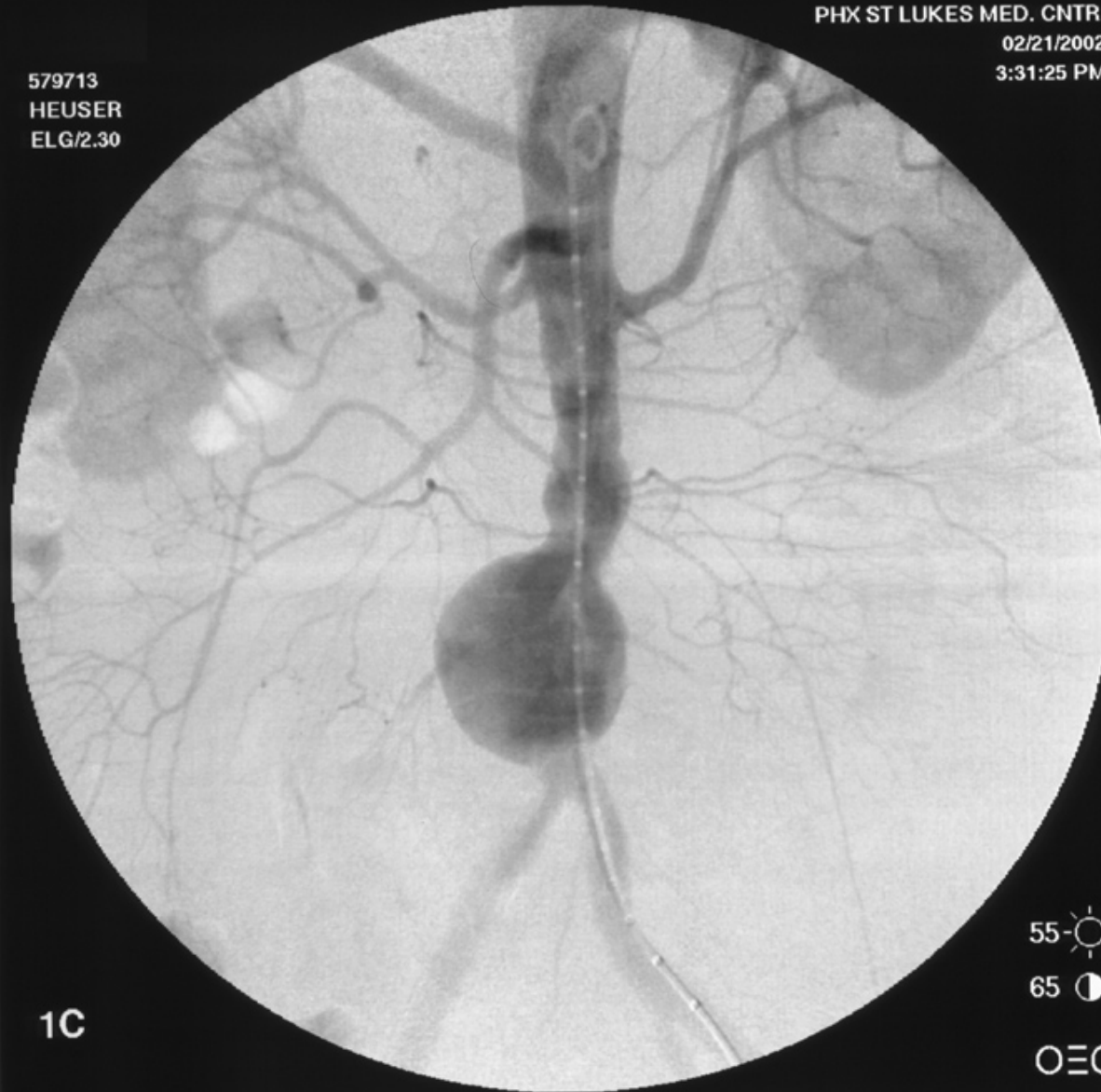


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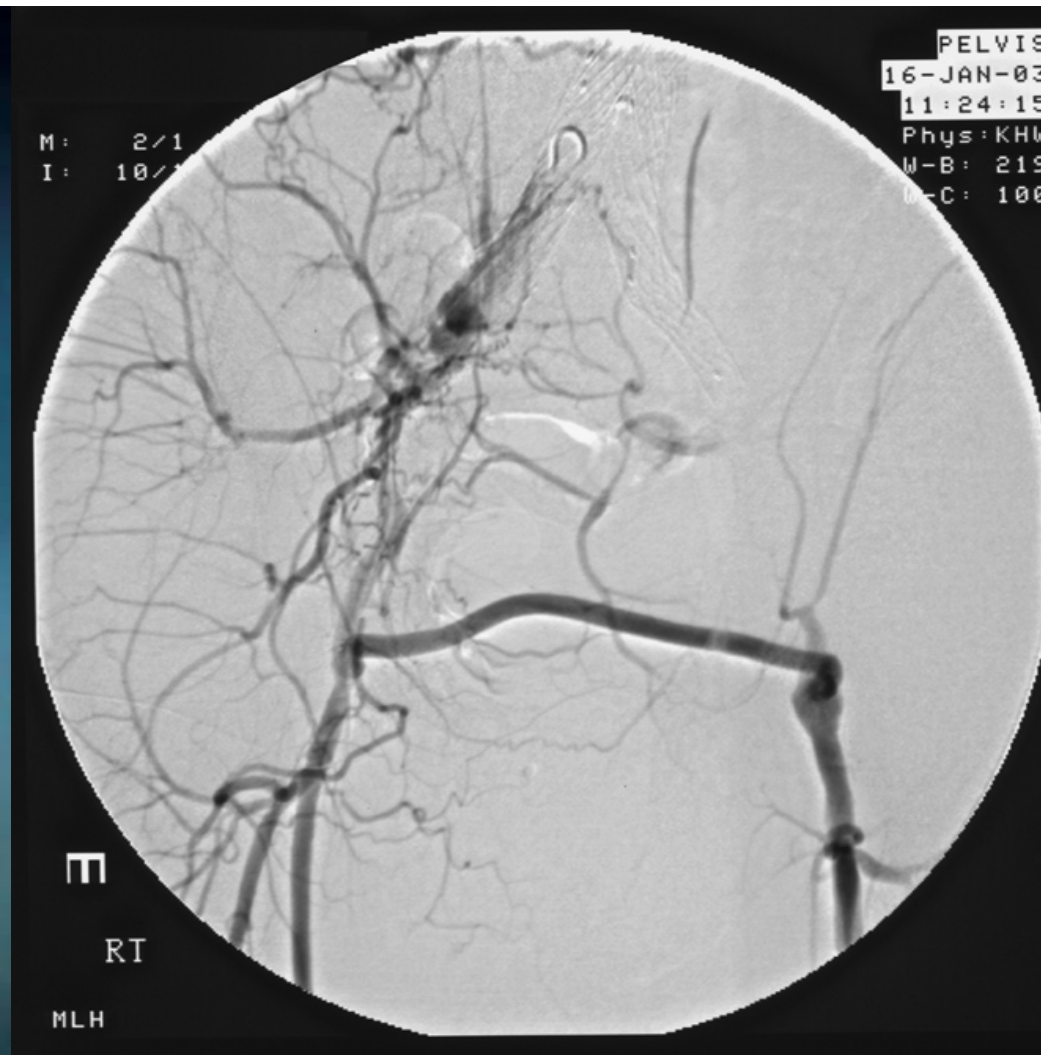
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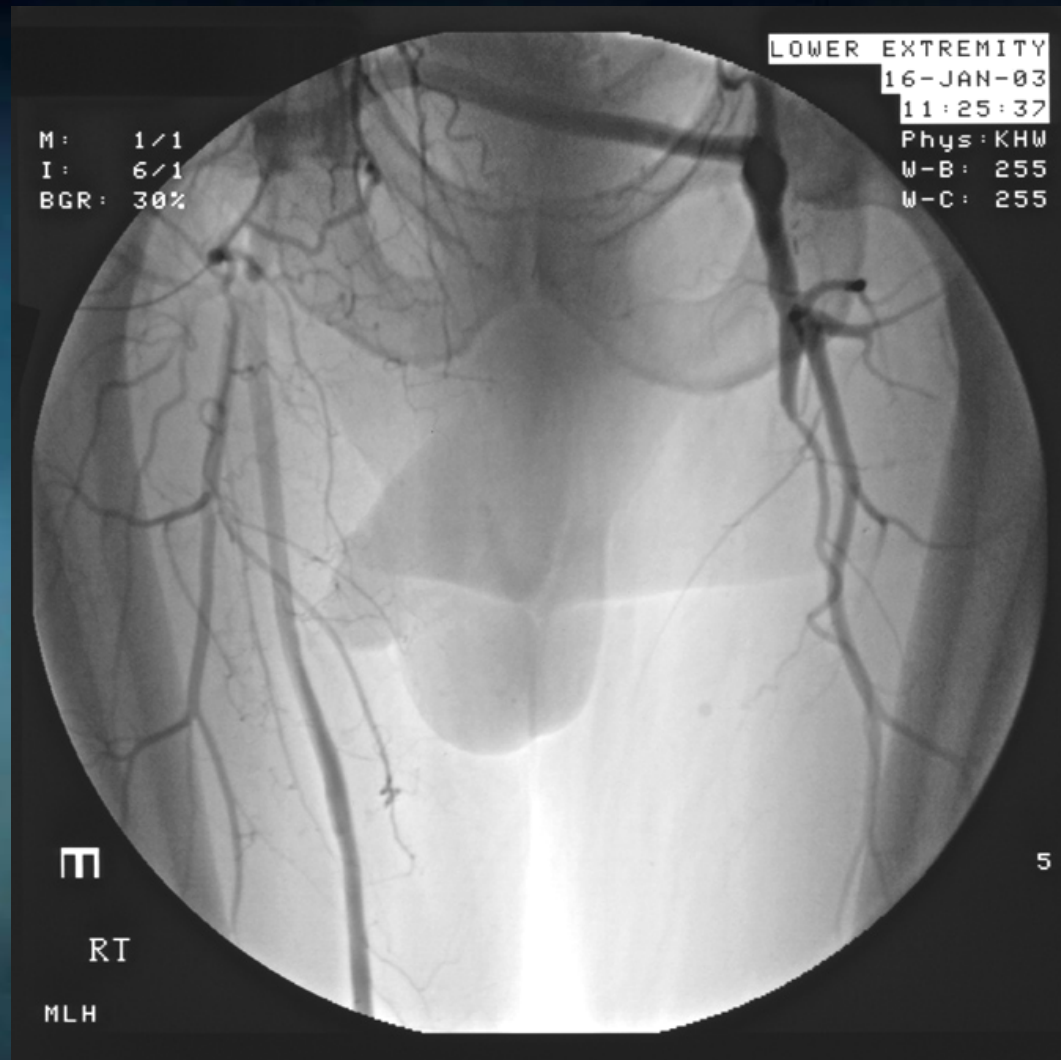




ELG with left leg of device occluded



Delineation of R to L Fem-Fem



Total occlusion of origin SFA



Collaterals filling left SFA CTO

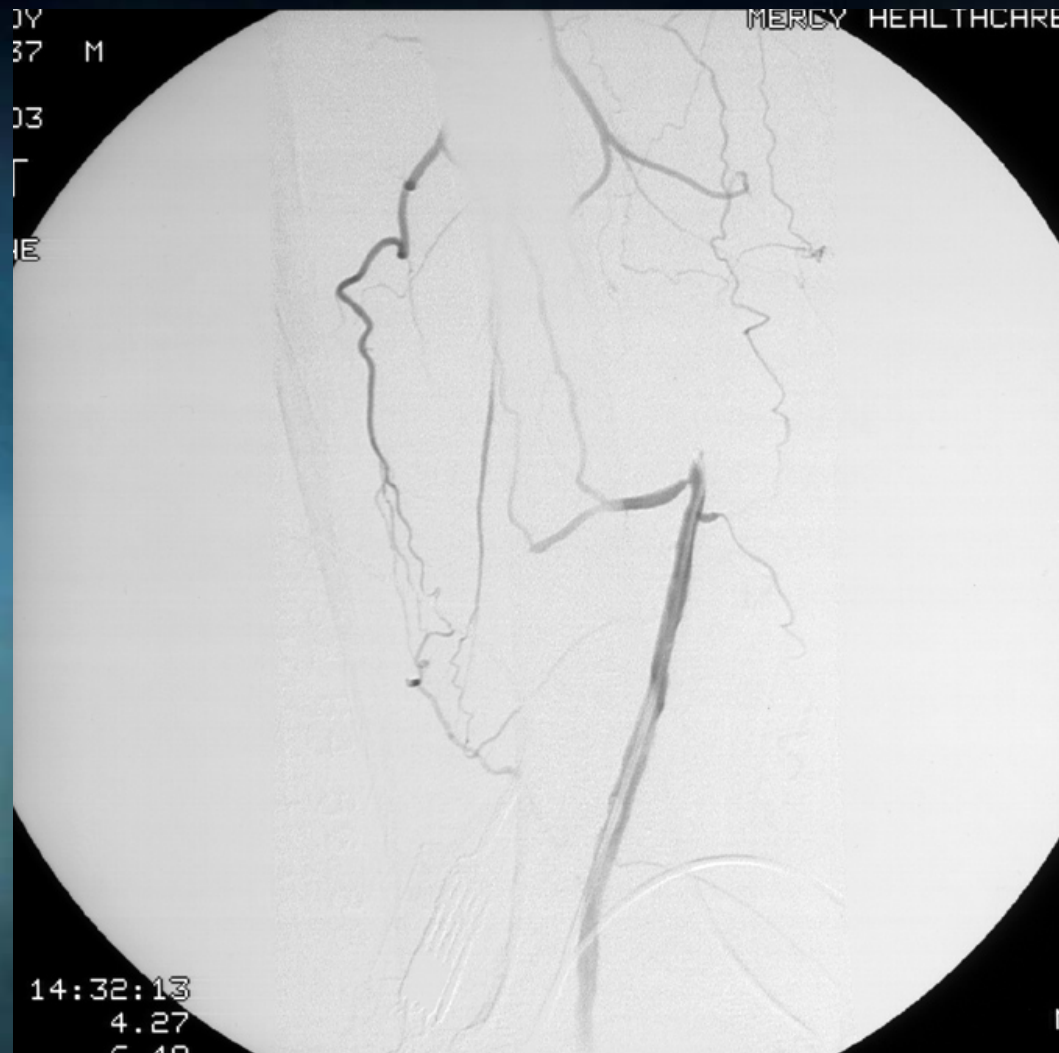


Excellent non-diseased popliteal

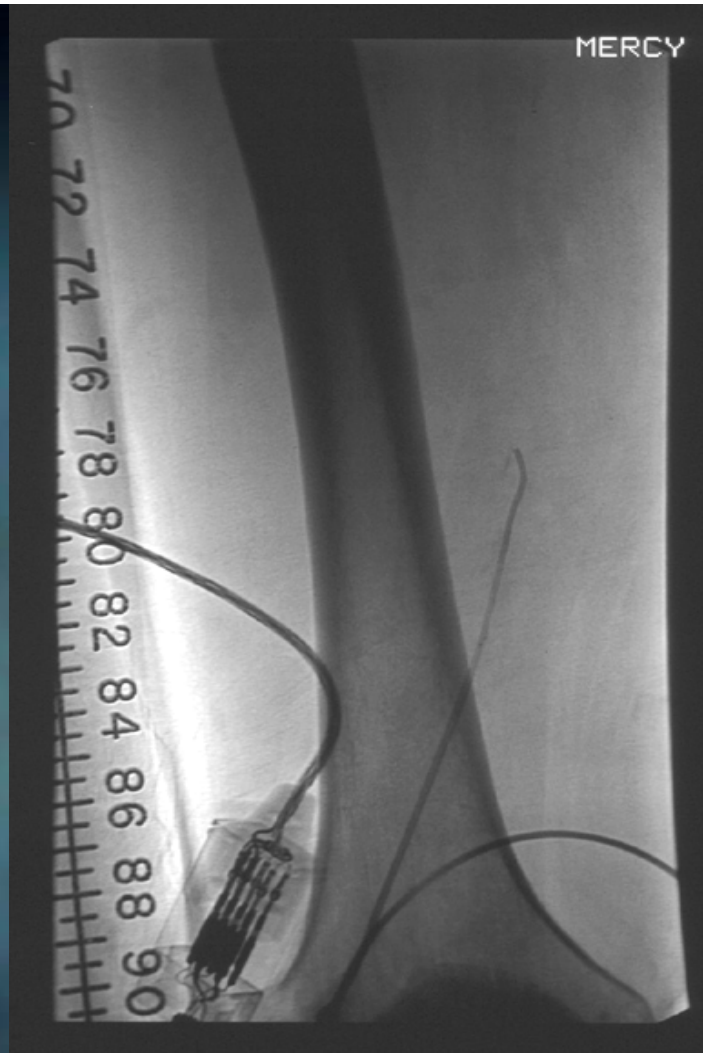
Arteriogram Reveals

- *Patent Right to Left Femoral-Femoral Graft*
- *Occluded Left Limb of ELG Device*
- *Total Occlusion of SFA*



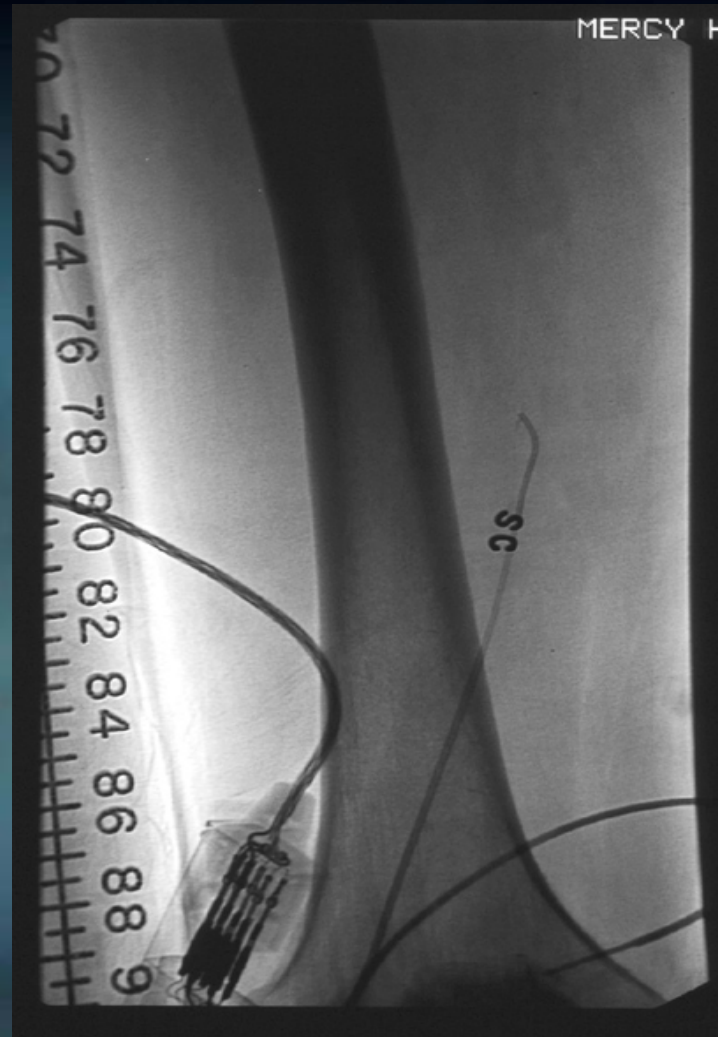


Injection via right side filling popliteal for approach

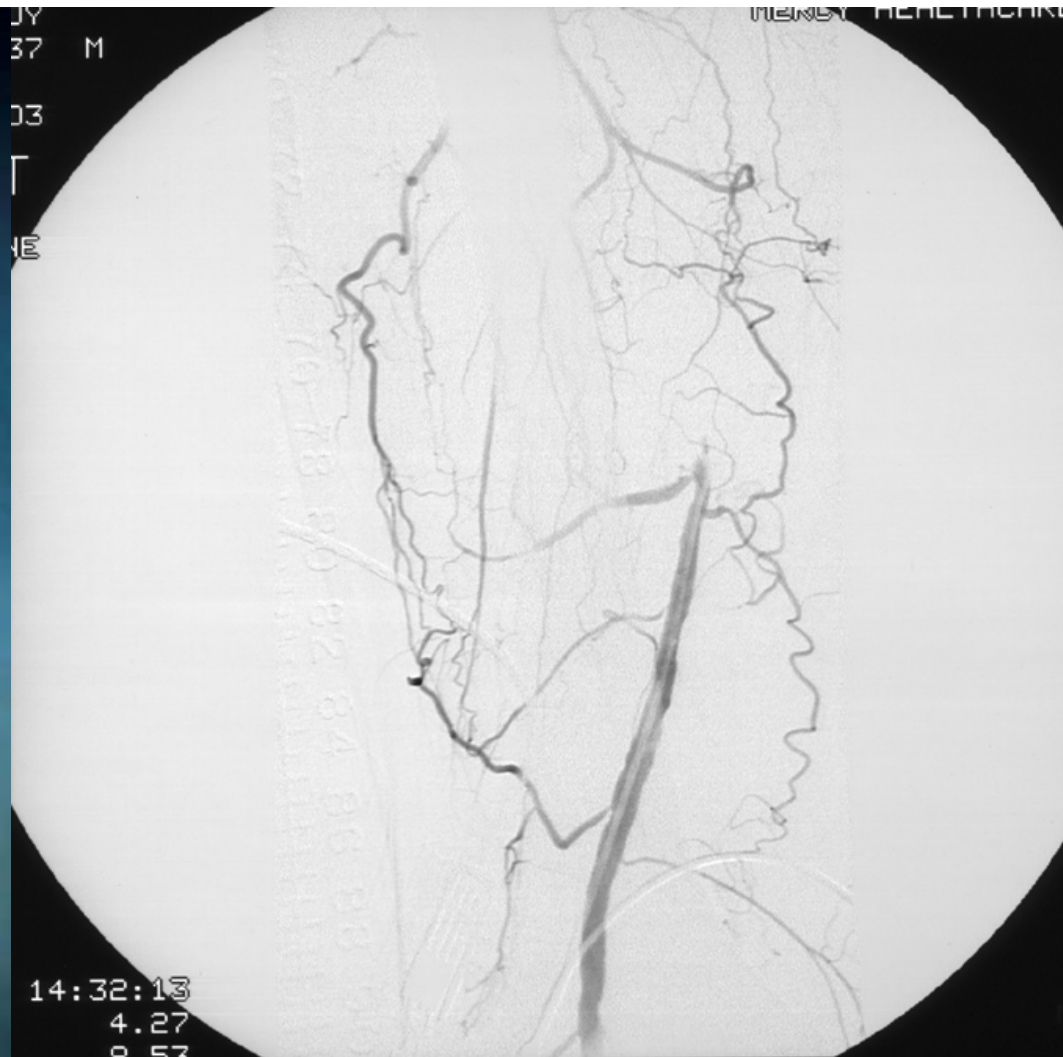


Glide catheter with glide wire attempt





.035 Safe-Cross in glide catheter into CTO



Glide catheter about 3 cm across CTO



Glide catheter into Fem-Fem Graft all the way across CTO





Confirmation of glide catheter in Fem-Fem portion



Recanalized SFA



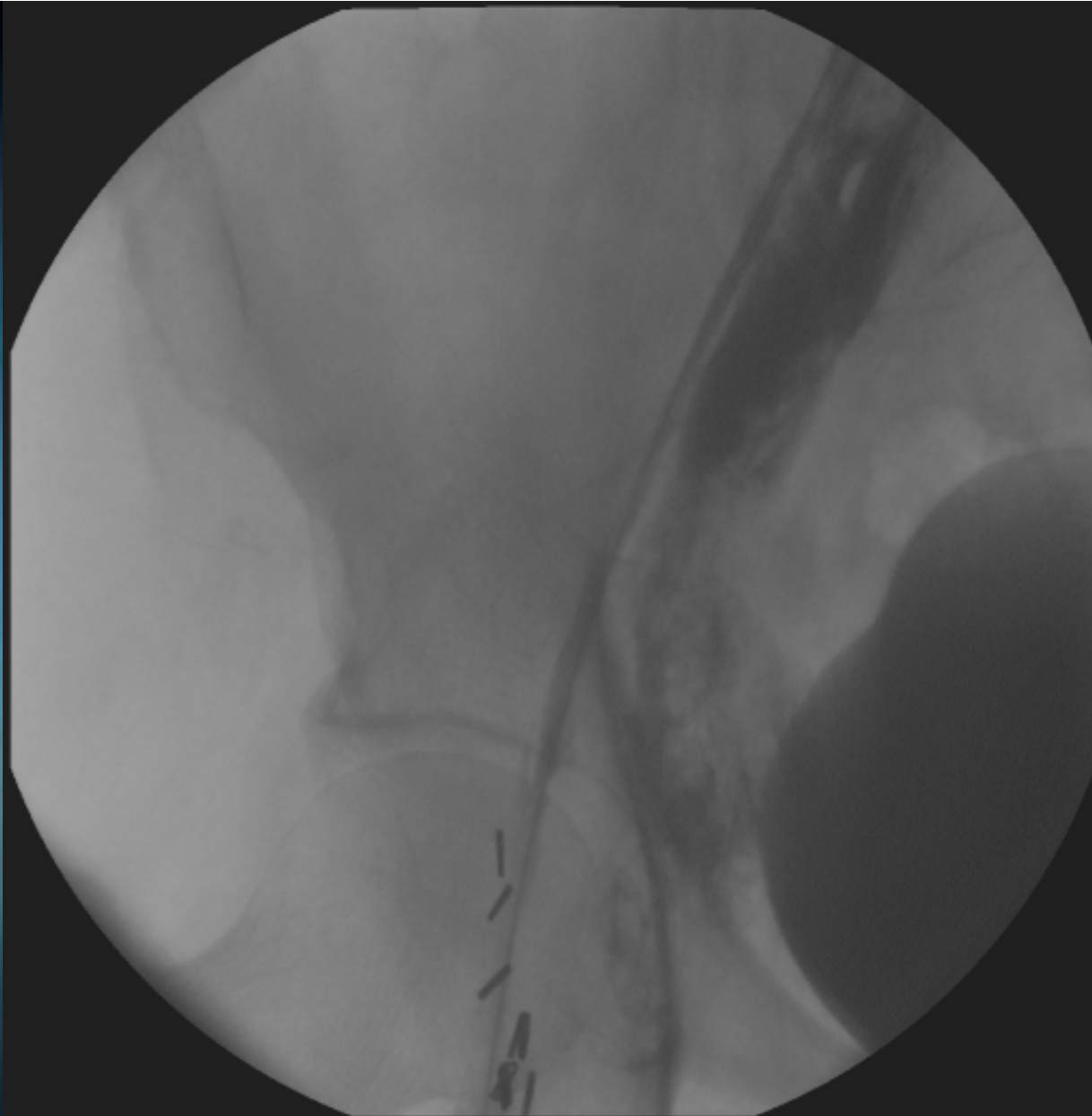


Recanalized SFA with good run off

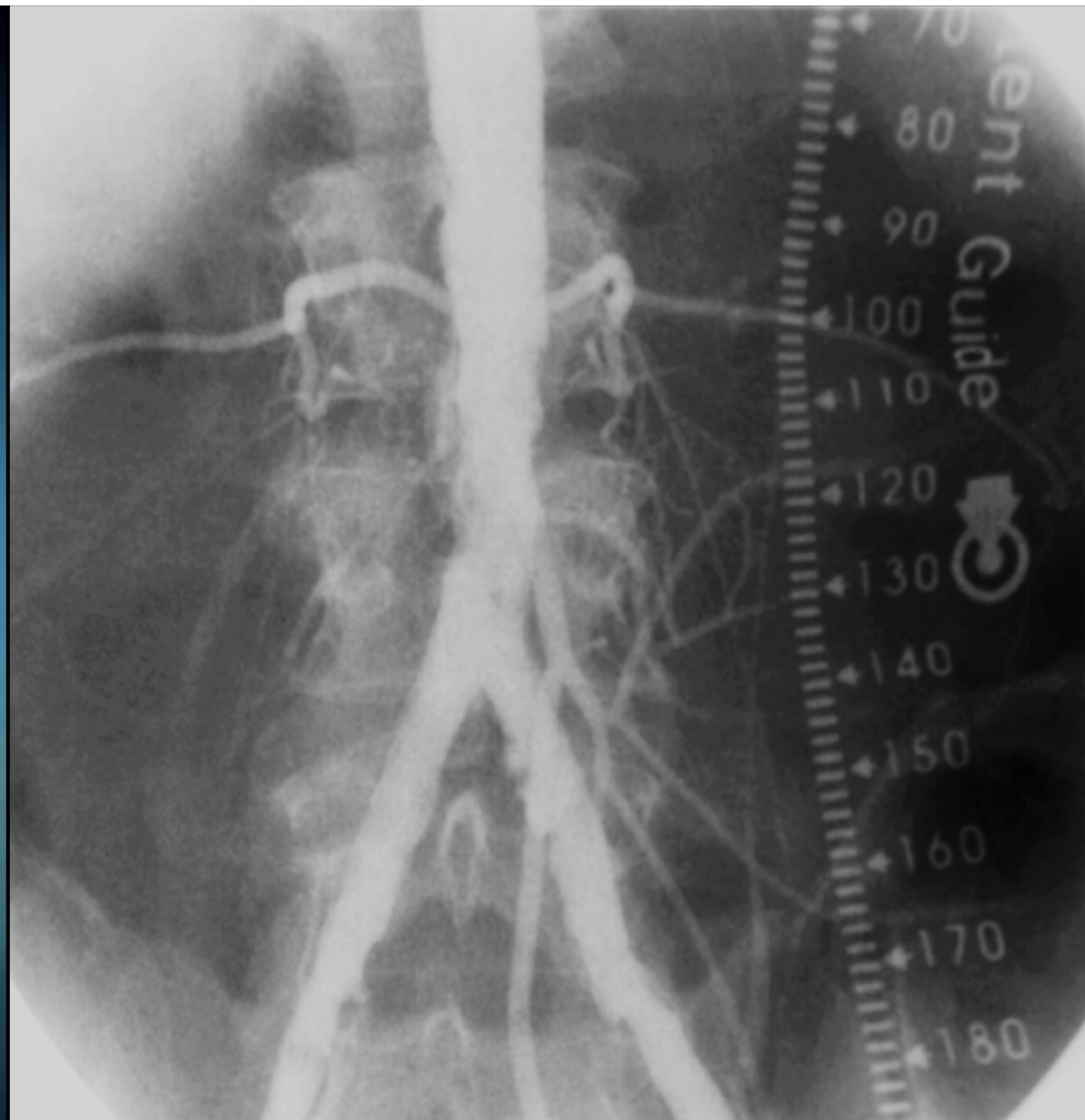
Potential Endoluminal Graft Complications

- *Dissection/Perforation*
- *Device malfunction/failure*
- *Thromboembolic Event*
- *Prosthetic Occlusion*
- *Prosthetic Migration*
- *Prosthetic Leak*
- *Limb Ischemia*
- *Ischemic Bowel*
- *Renal Failure*
- *Wound Infection*
- *Coagulopathy*
- *MI*
- *Arrhythmias*



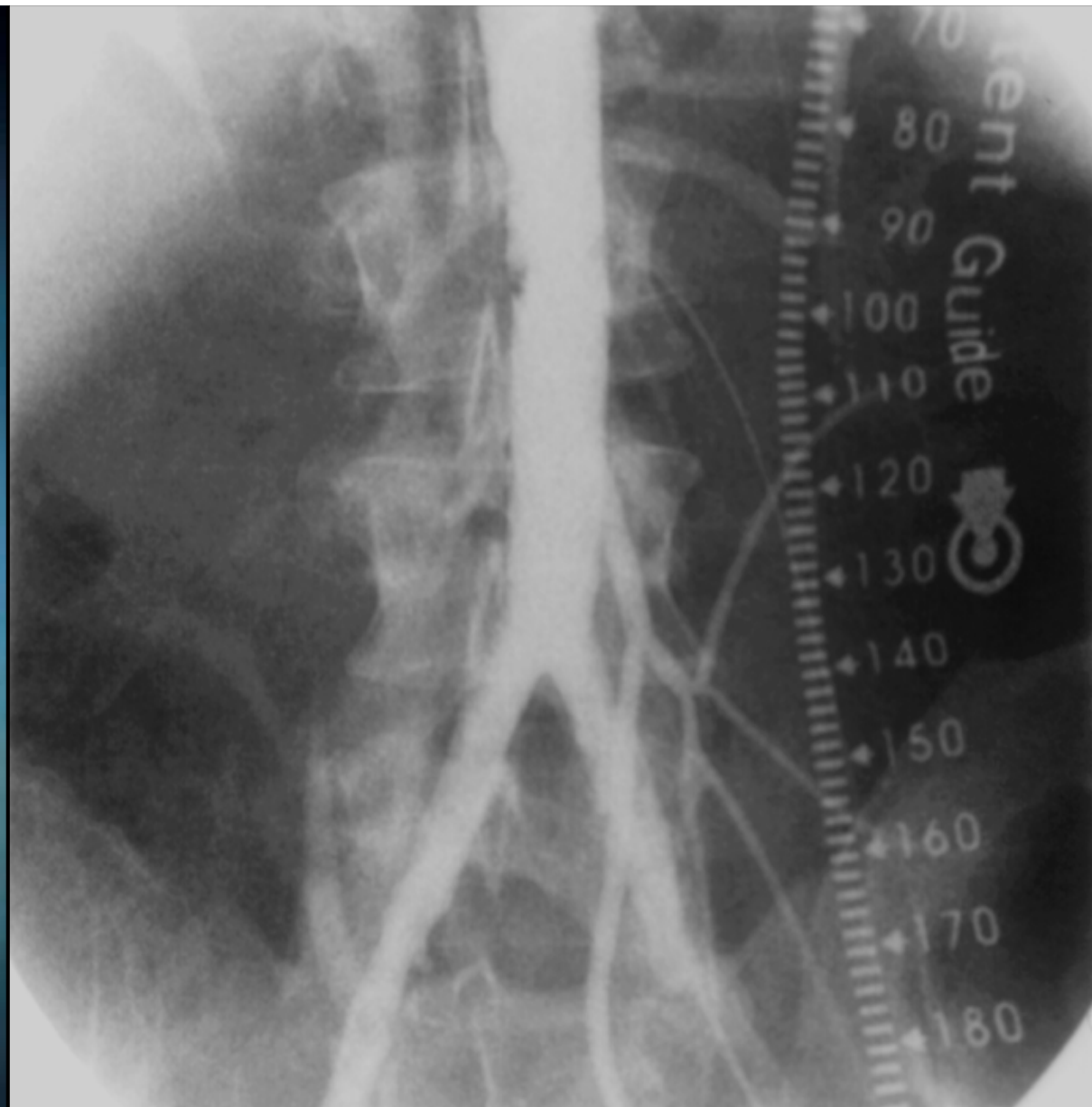




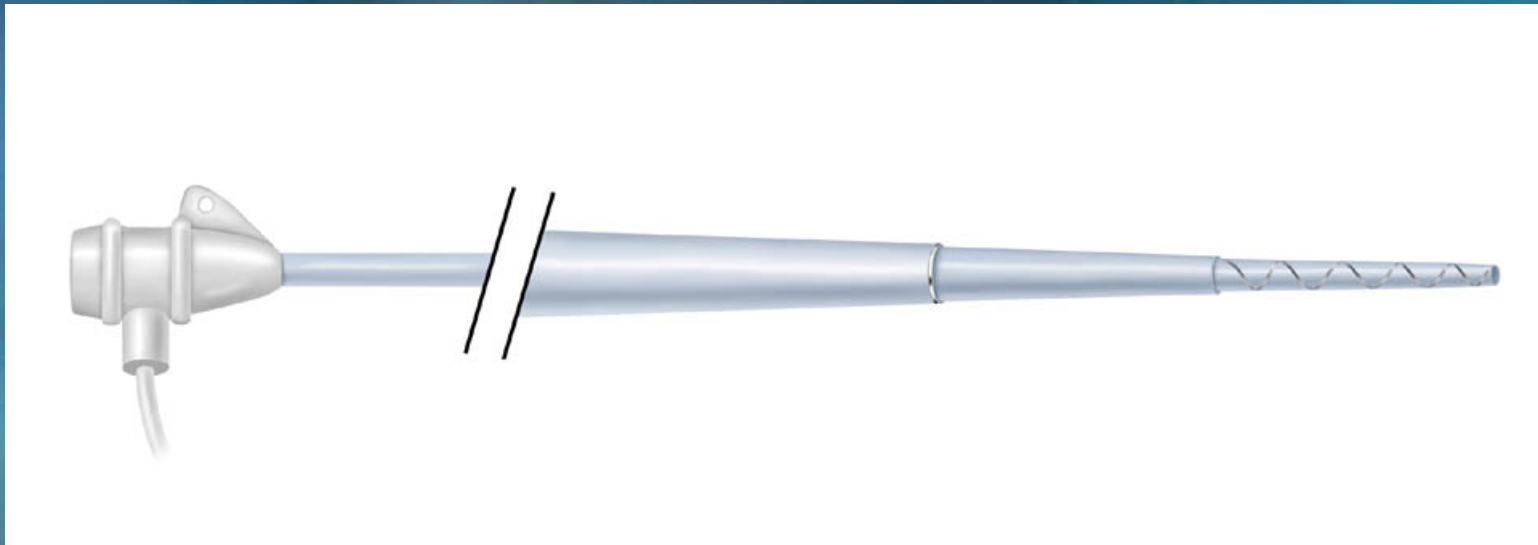


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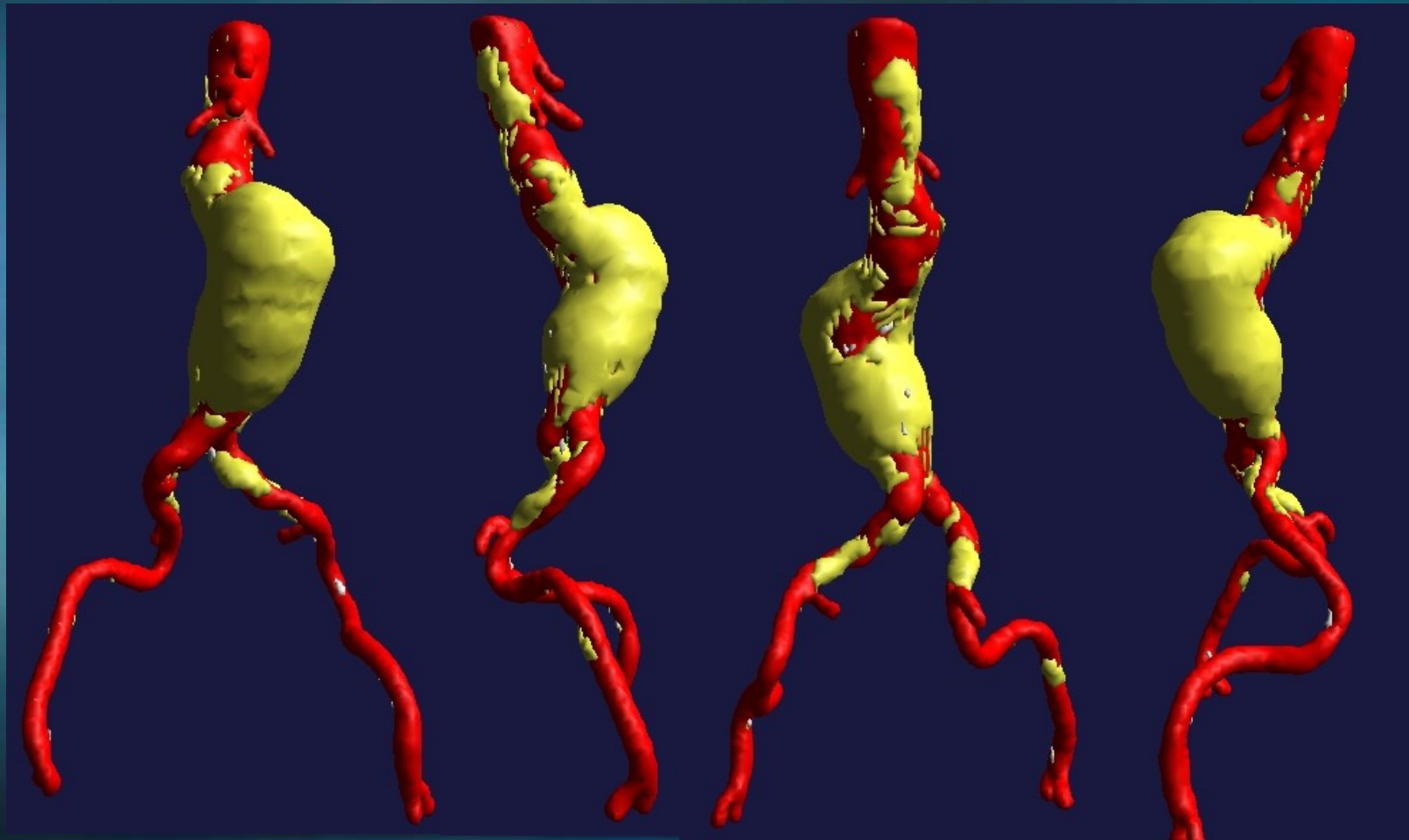








Early Clinical Evaluation



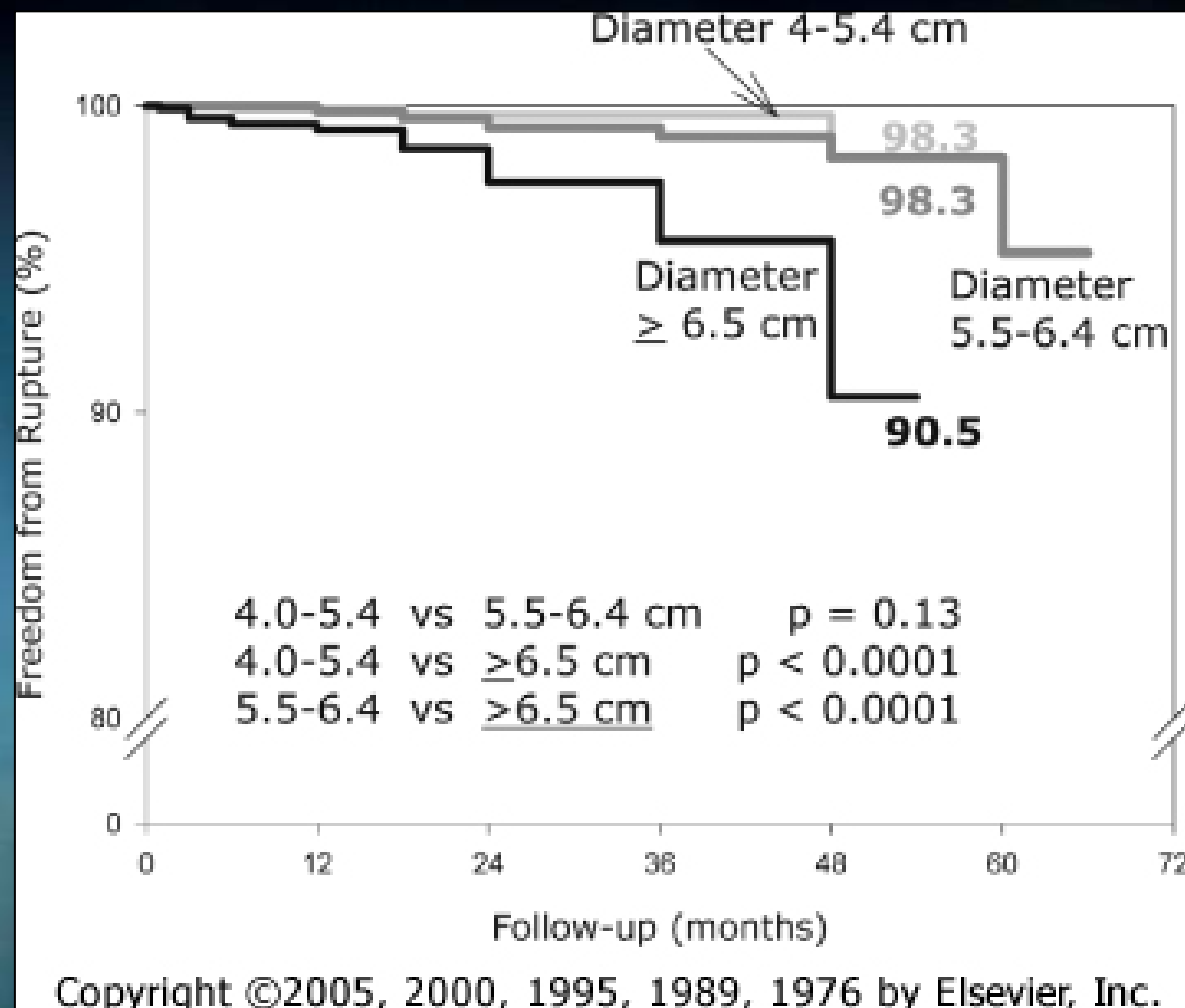
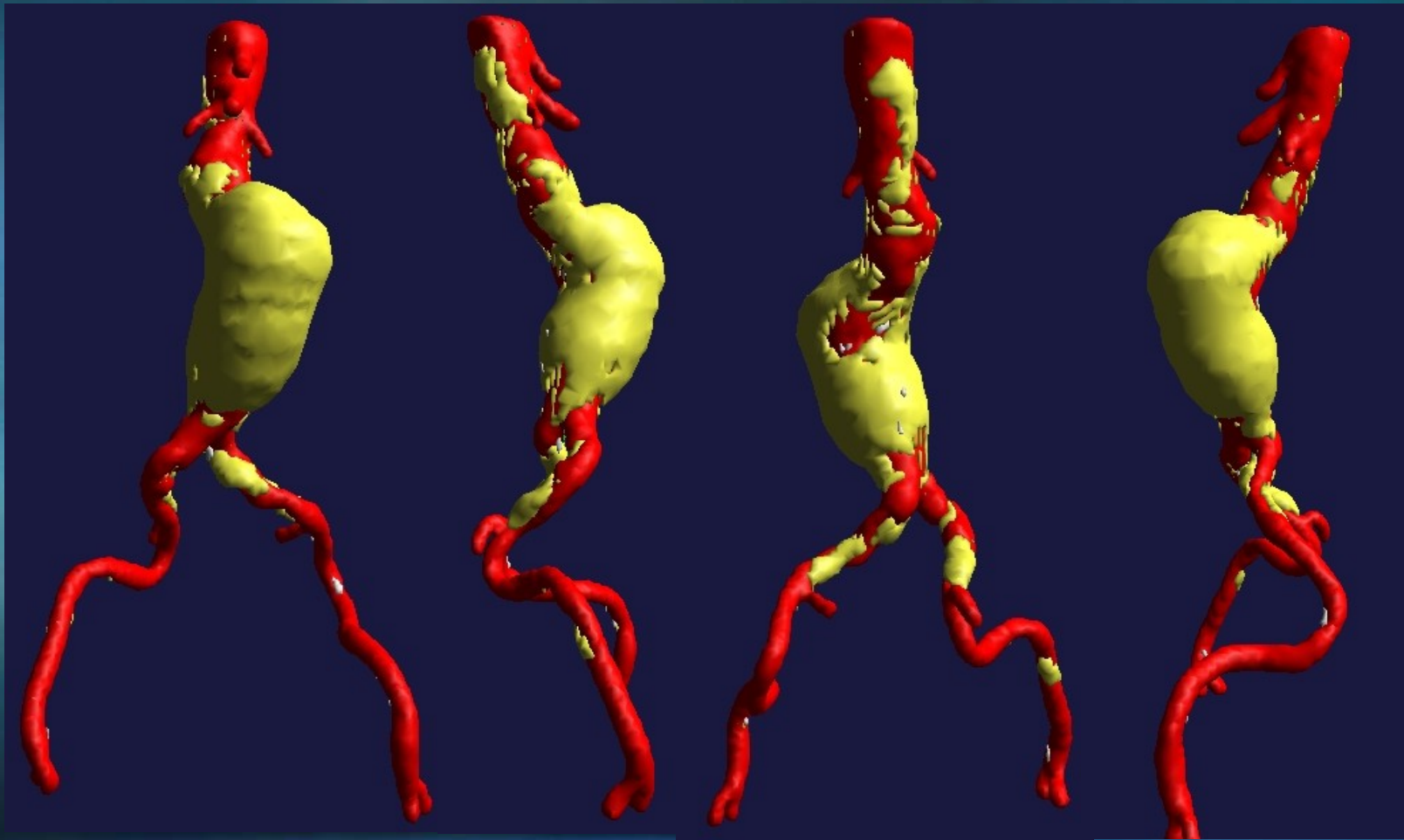


Figure 101-9 Cumulative freedom from rupture after endovascular aneurysm repair in patients with aneurysms measuring 4 to 5.4 cm, 5.5 to 6.4 cm, and more than 6.5 cm. (From Ouriel K, Clair DC, Greenberg RK, et al: Endovascular repair of abdominal aortic aneurysms: Device-specific outcome. J Vasc Surg 37:991-998, 2003.)

Early Clinical Evaluation



TYPES, ETIOLOGY, AND TREATMENT OF ENDOLEAKS

Type	Etiology	Treatment
1	Attachment Site	PTA, Balloons, Stents
2	Collaterals	Embolization
3	Graft Failure	Graft Repair
4	Porousity	No Treatment Needed



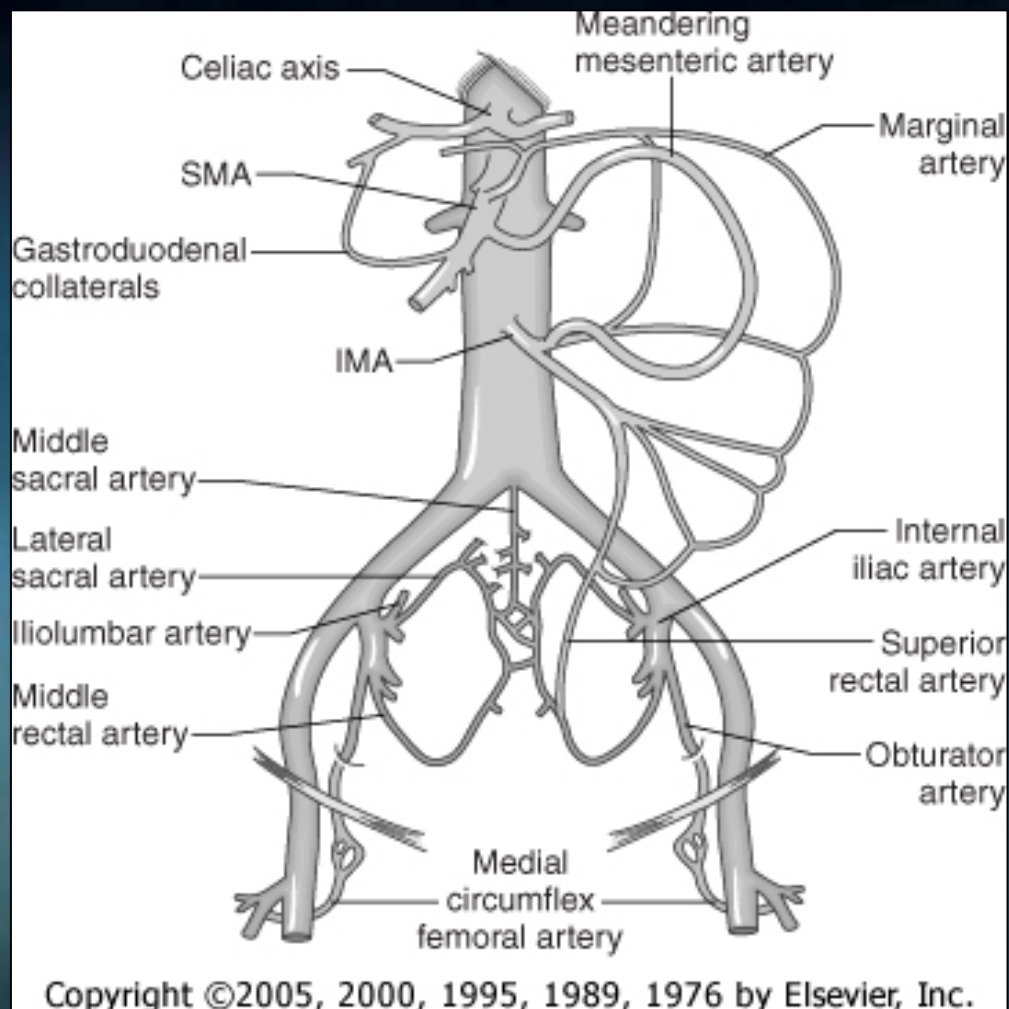
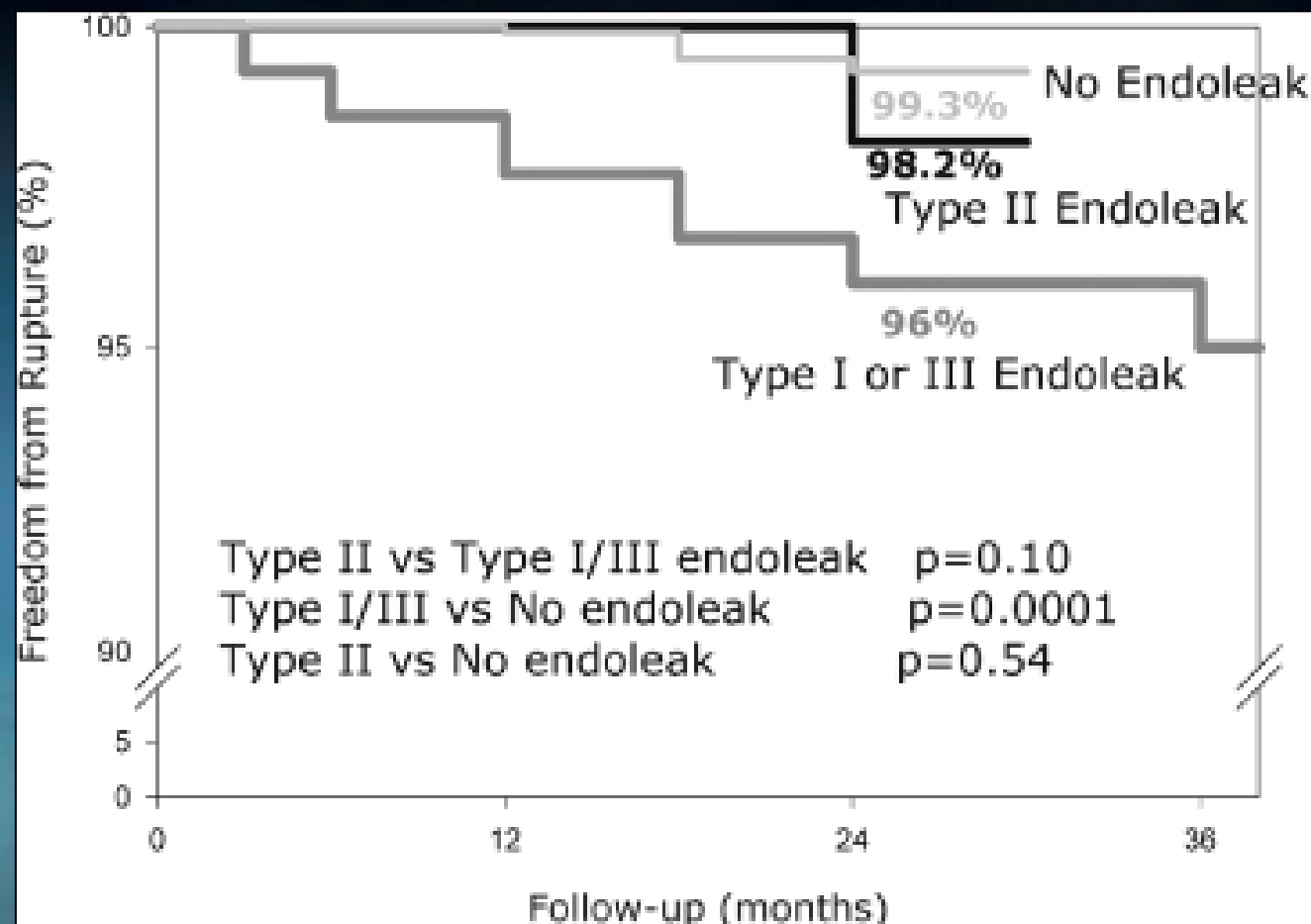


Figure 100-13 Important collateral pathways for the sigmoid colon and pelvis. IMA, inferior mesenteric artery; SMA, superior mesenteric artery. (From Bergman RT, Gloviczki P, Welch TJ, et al: The role of intravenous fluorescein in the detection of colon ischemia during aortic reconstruction. *Ann Vasc Surg* 6:74, 1992.)

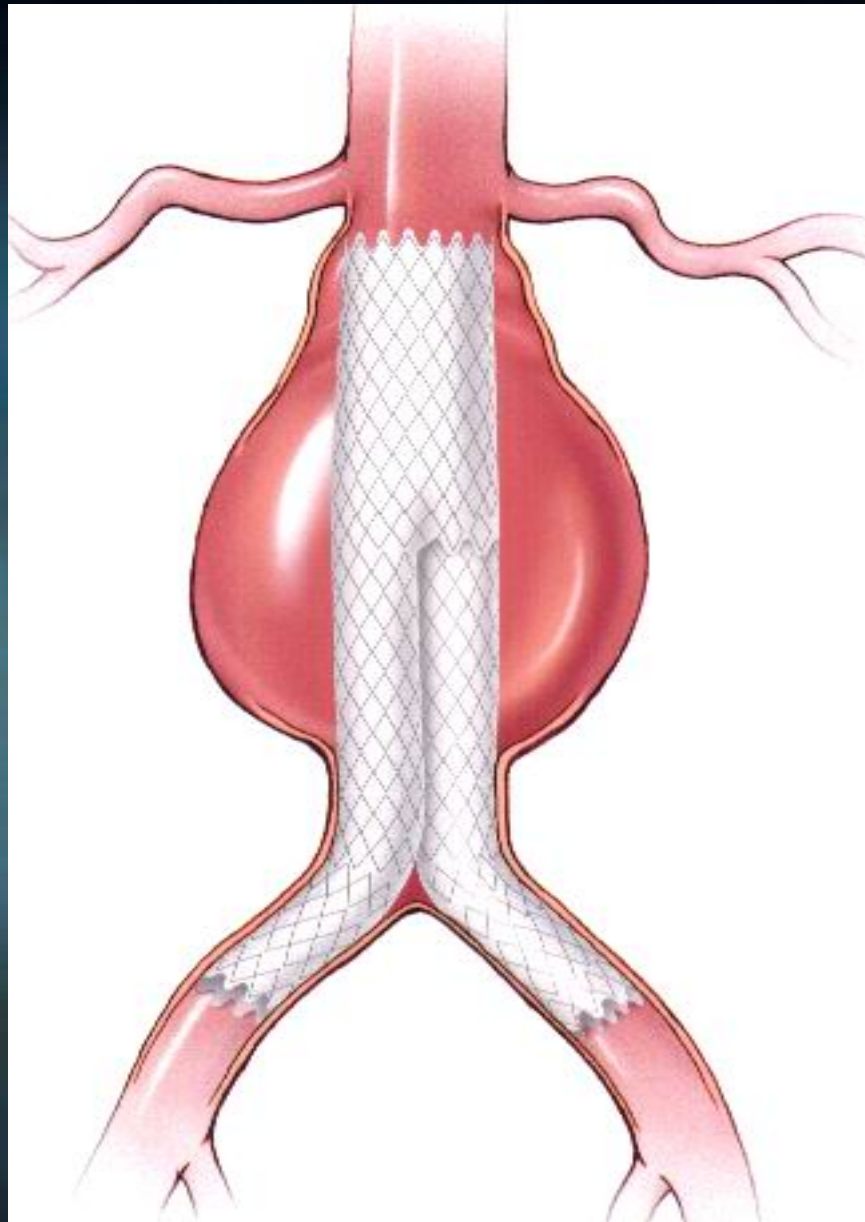


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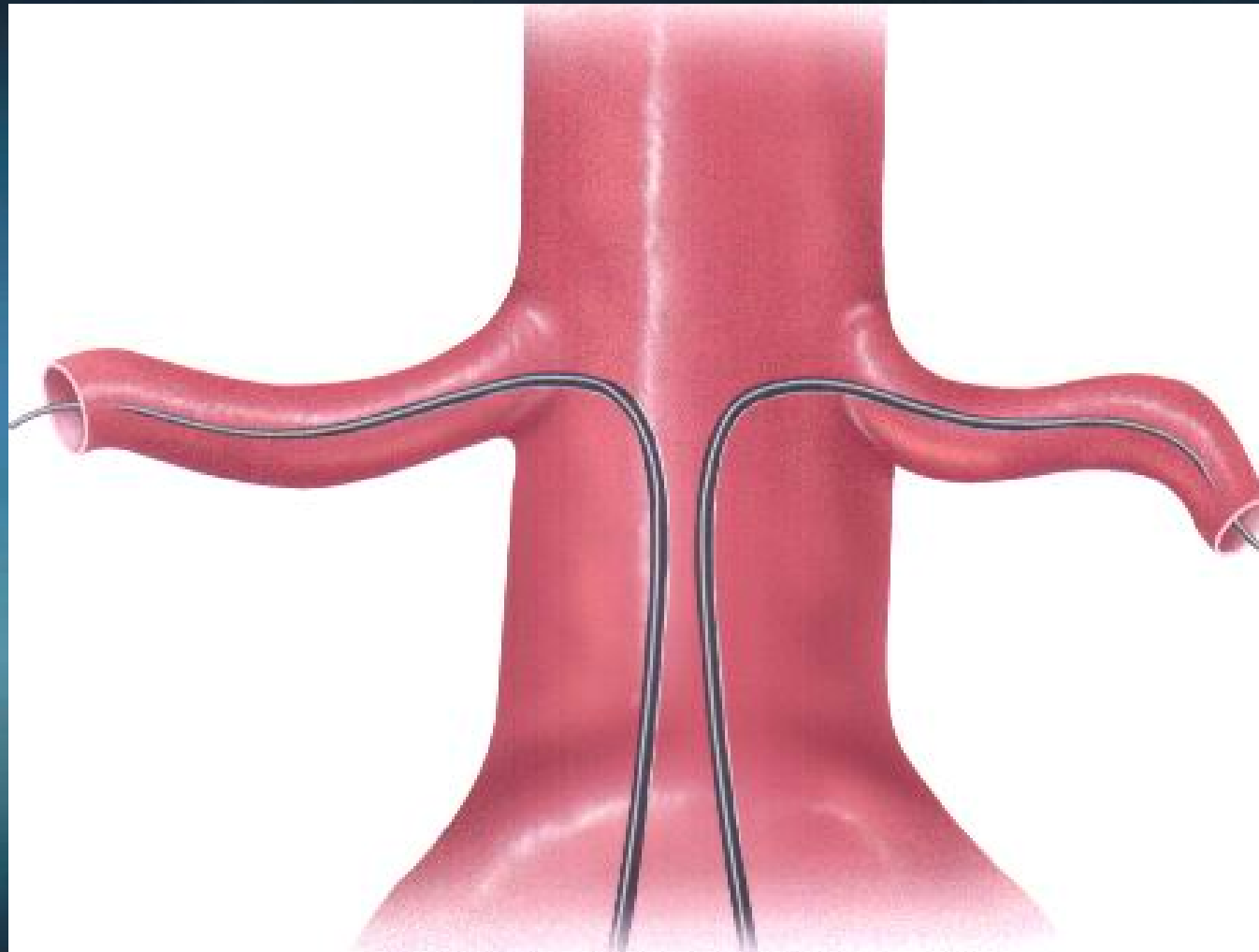
Figure 101-8 Freedom from aneurysm rupture after endovascular aneurysm repair in patients categorized according to endoleak with isolated type II endoleak, with type I or type III endoleak, and without endoleak. (From Van Marrewijk C, Buth J, Harris PL, et al: Significance of endoleaks after endovascular repair of abdominal aortic aneurysms: The EUROSTAR experience. *J Vasc Surg* 35:461-473, 2002.)

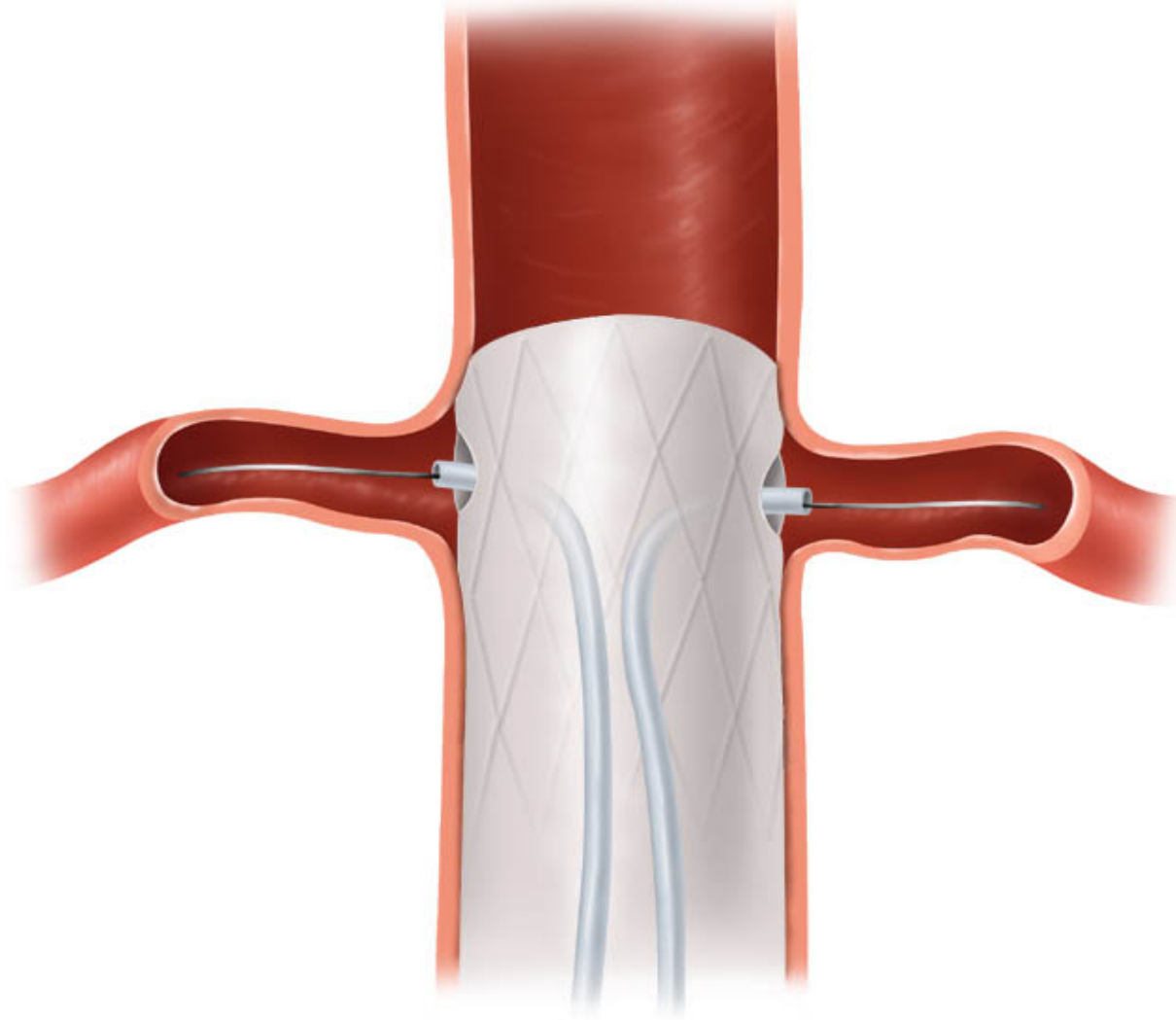


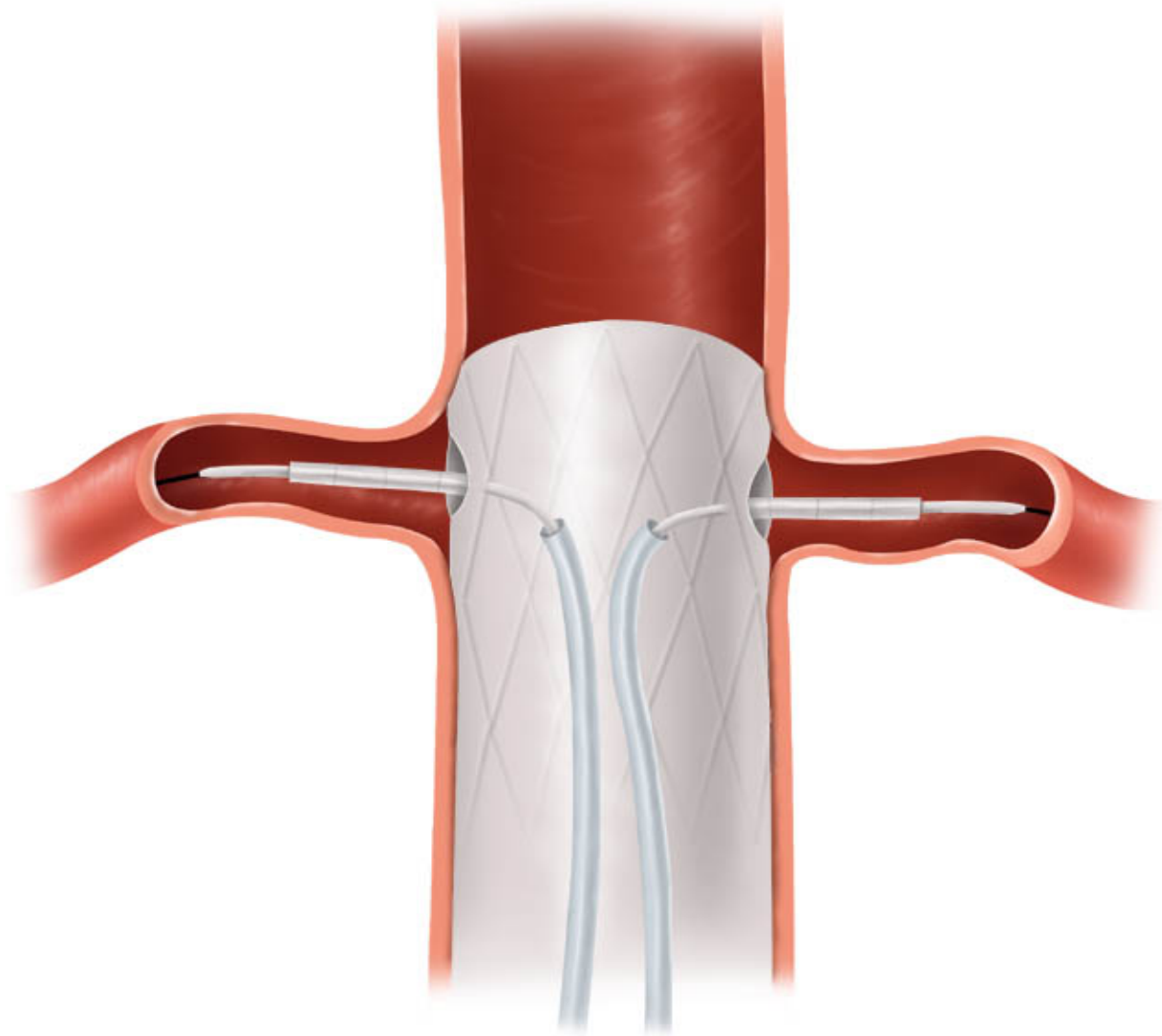


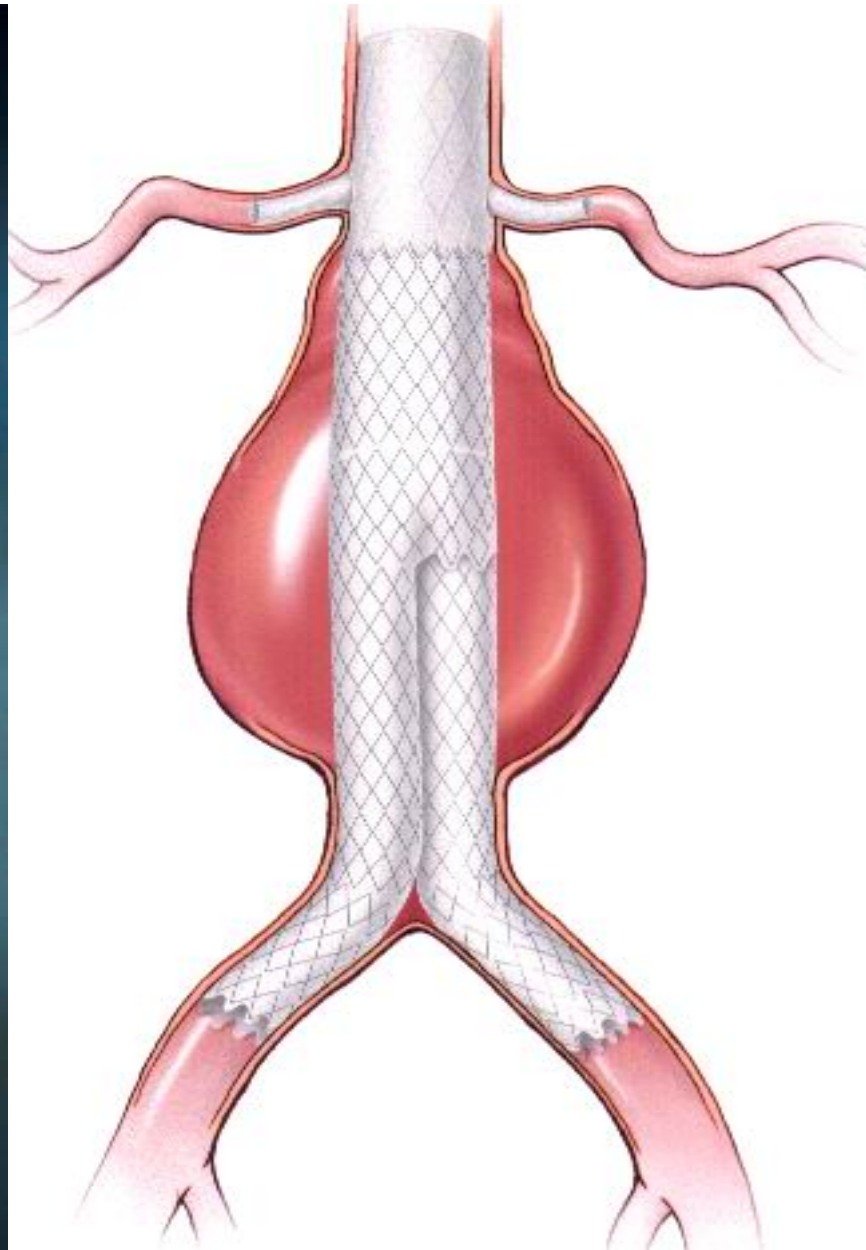


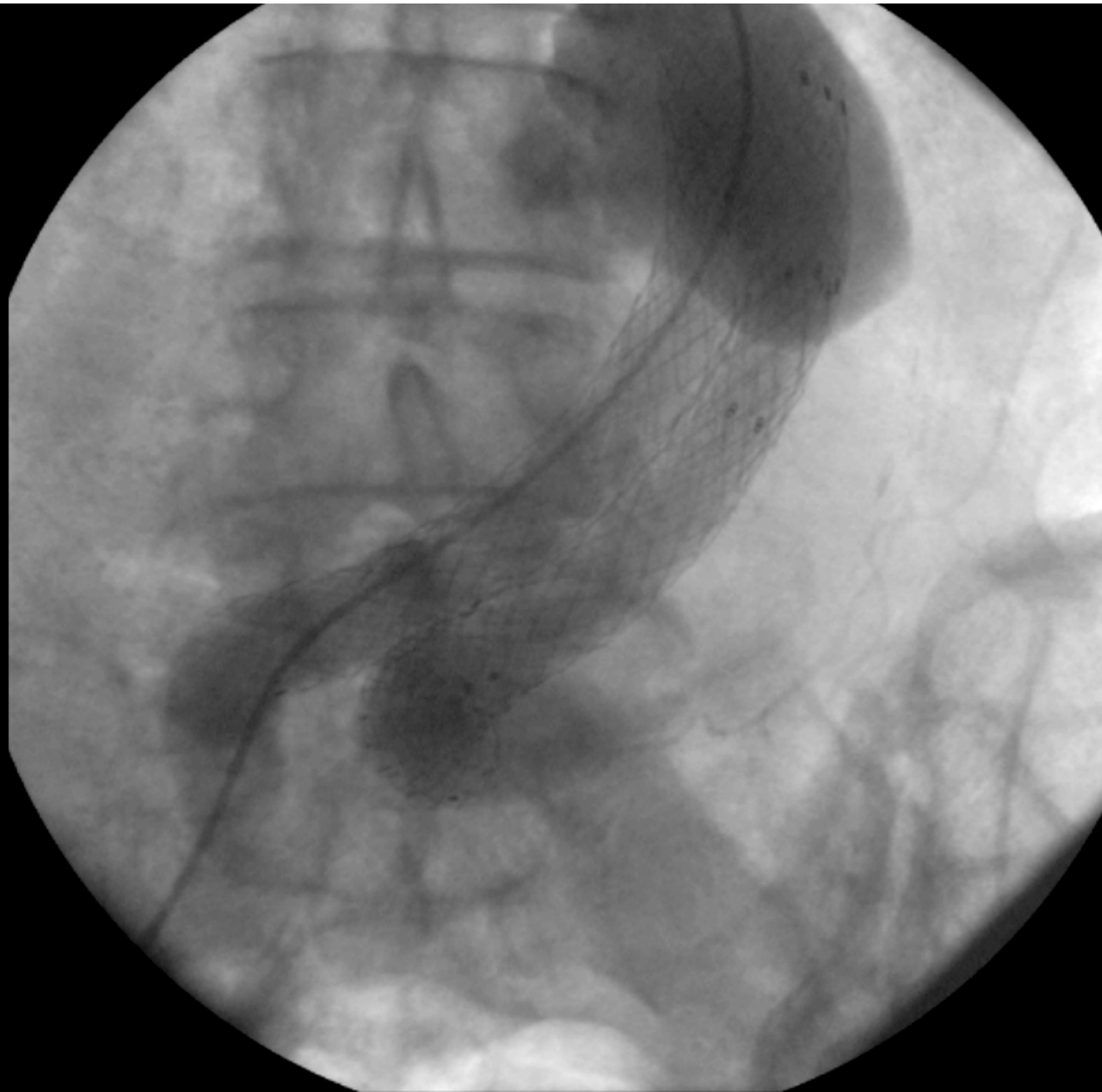












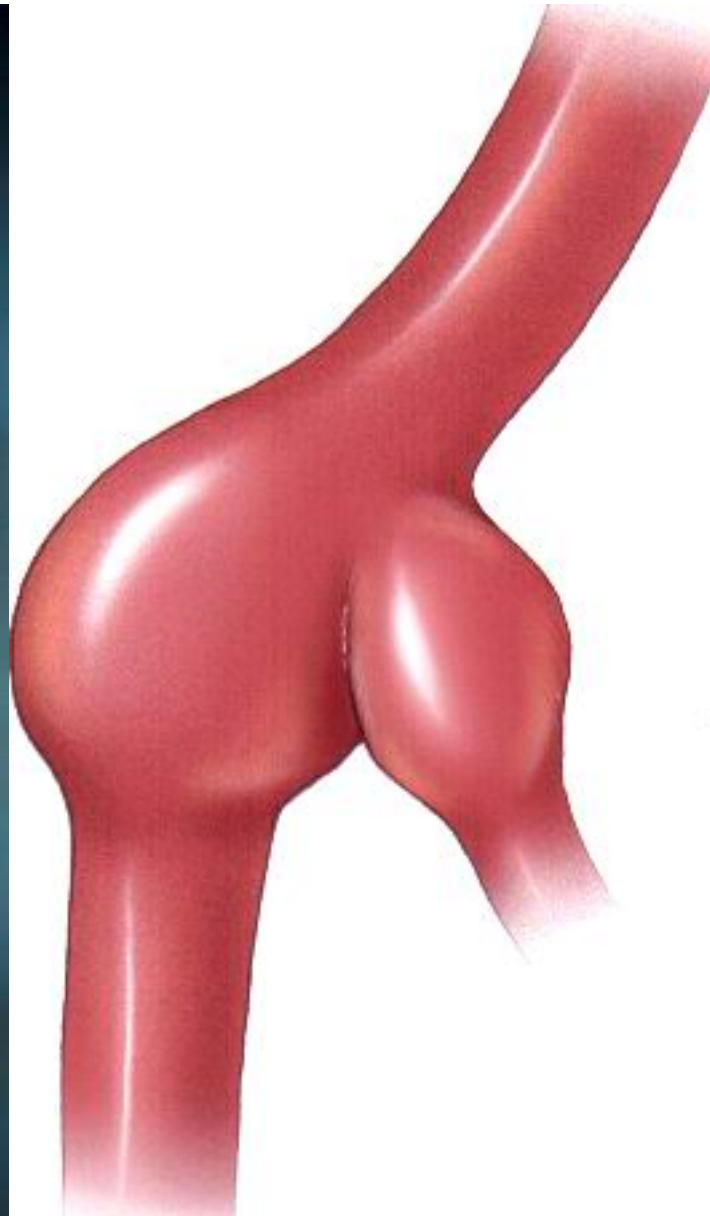


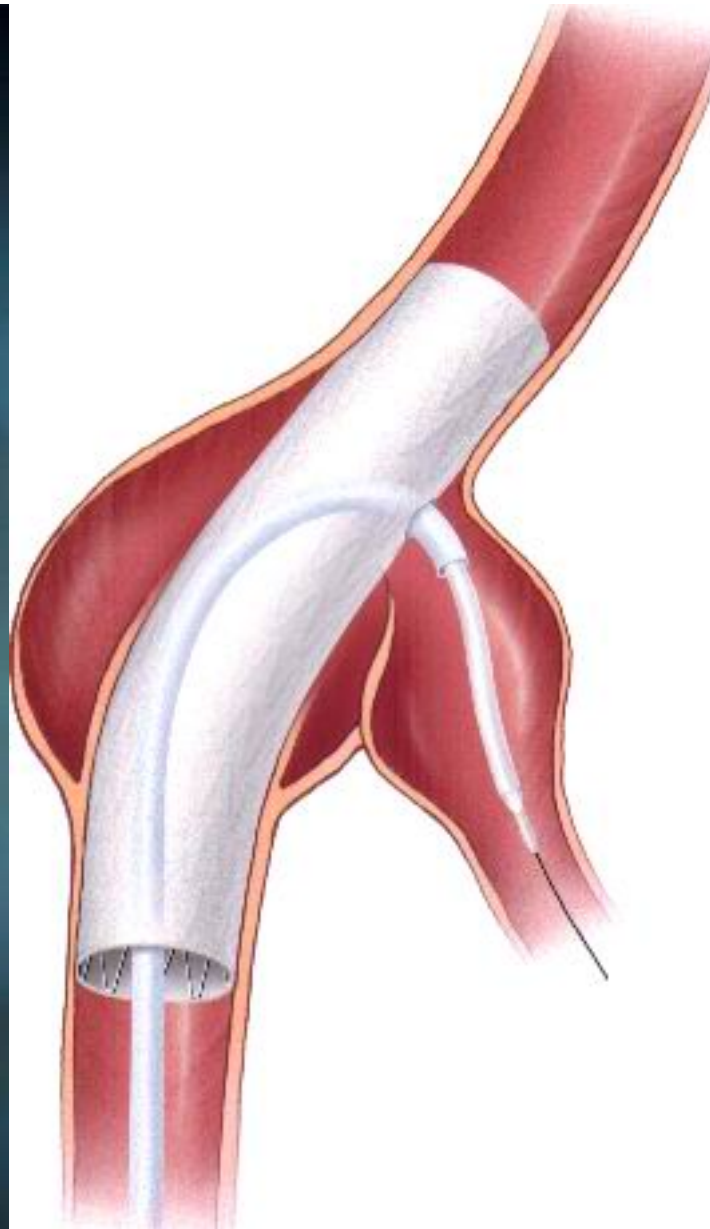
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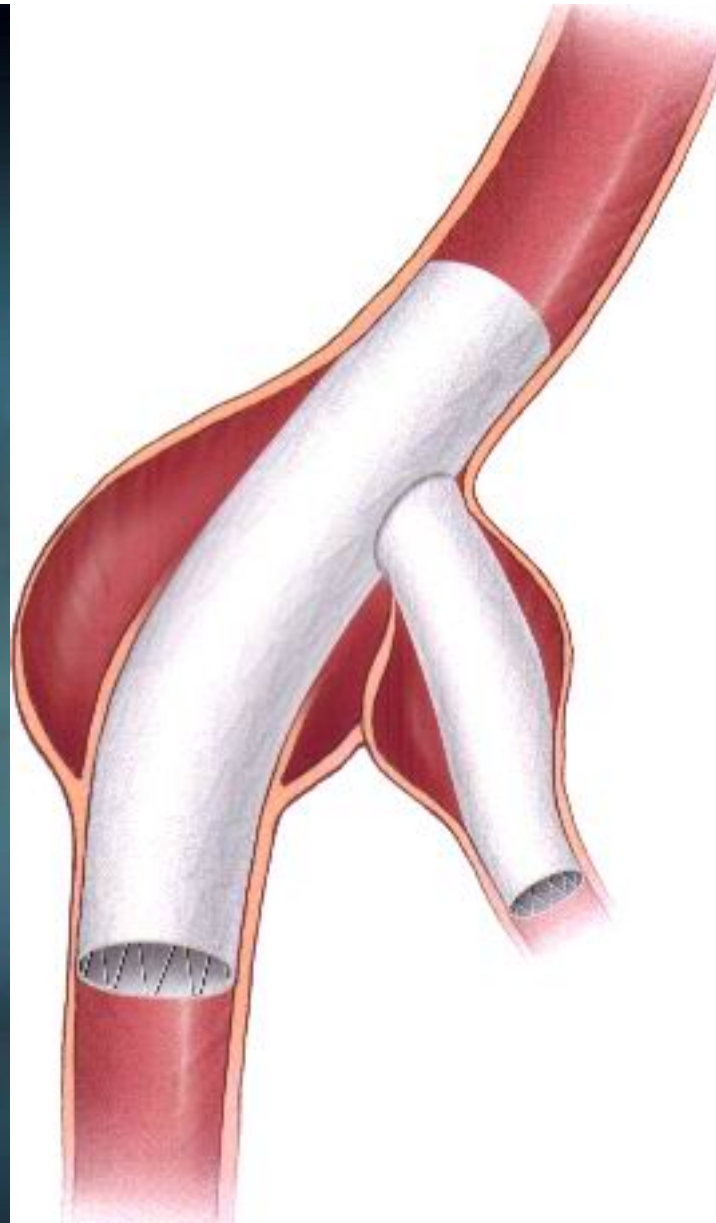
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Figure 101-3 A, Three-dimensional reconstruction after fenestrated stent-graft with bare stents in the renal arteries. (Courtesy Dr. E. L. Verhoeven.) B, Artist's impression of branched endograft currently validated in experiment. (Courtesy Dr. W. Wisselink.)









Aortic Aneurysm Rupture

- *50% will die prior to getting medical help*
- *Contained rupture patients easiest to treat*
- *Mortality for repair of ruptured aortic aneurysms 50-90%*

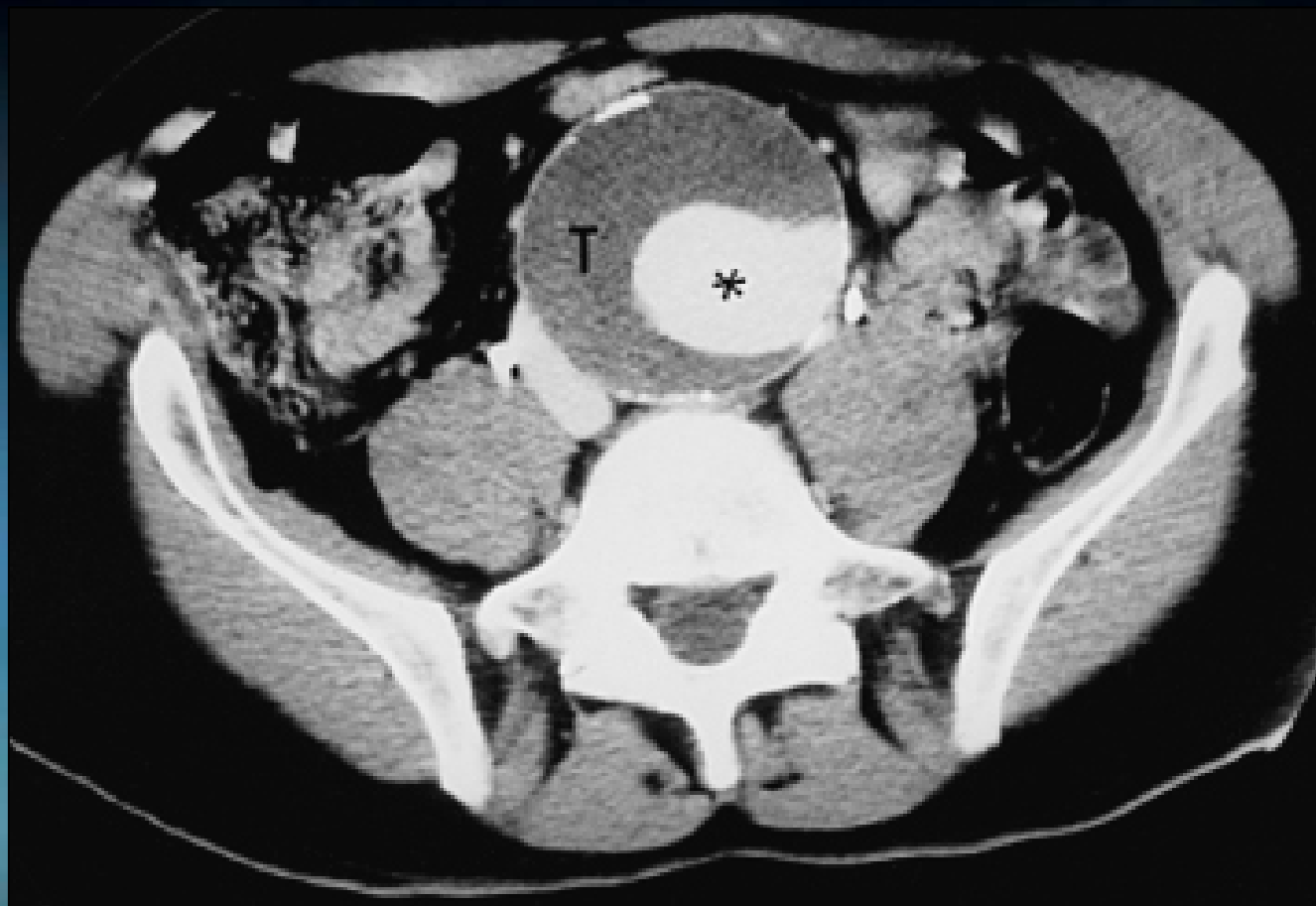


Abdominal Aortic Aneurysm Rupture

Annual Risk of Rupture

- *< 5 cm 1-2%*
- *5-6 cm 10%*
- *>6 cm 25%*



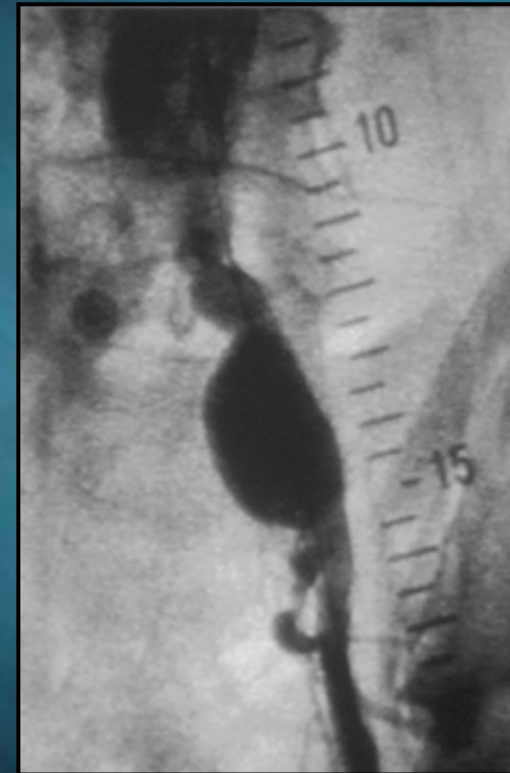
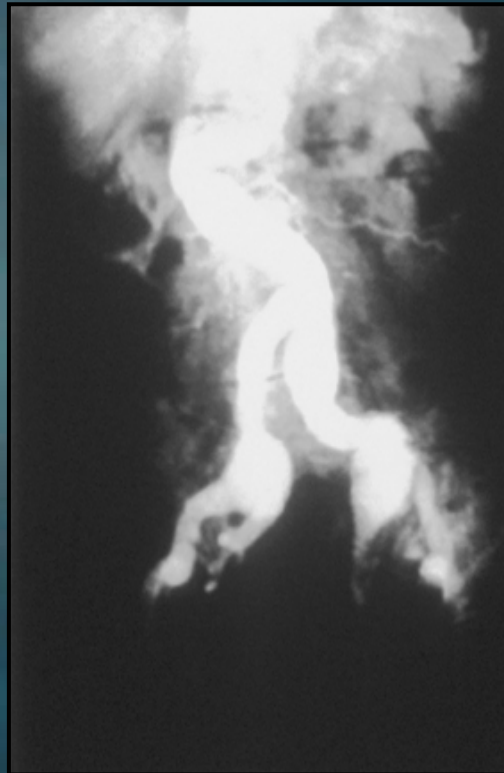
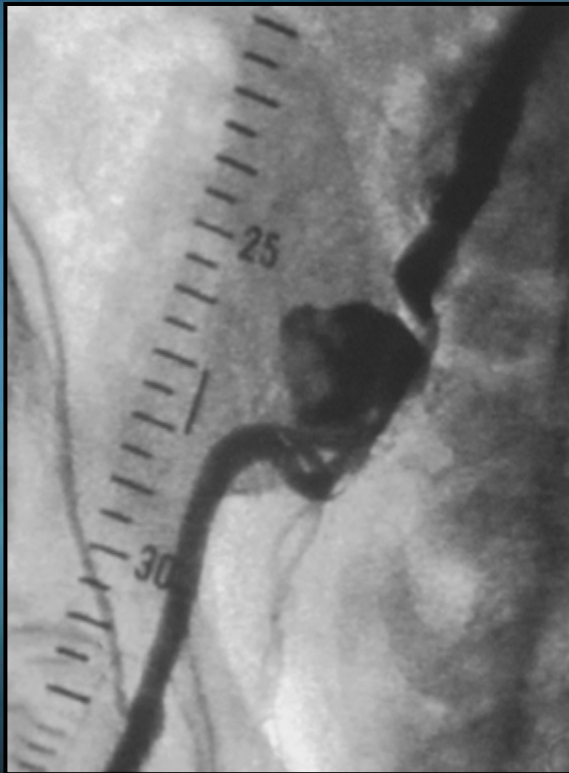


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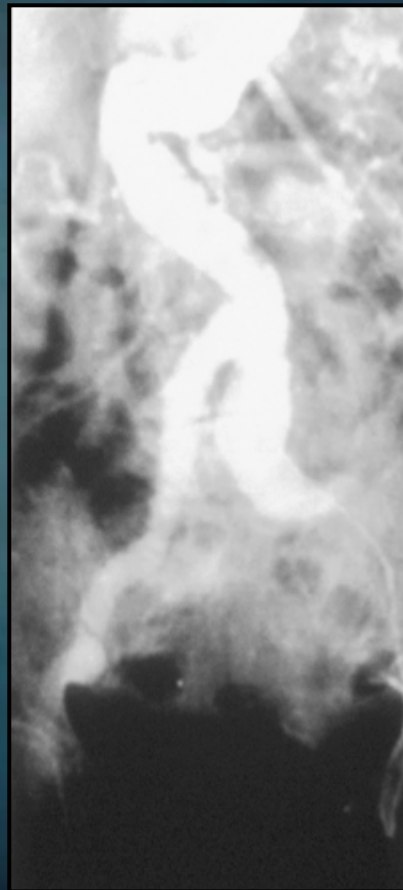
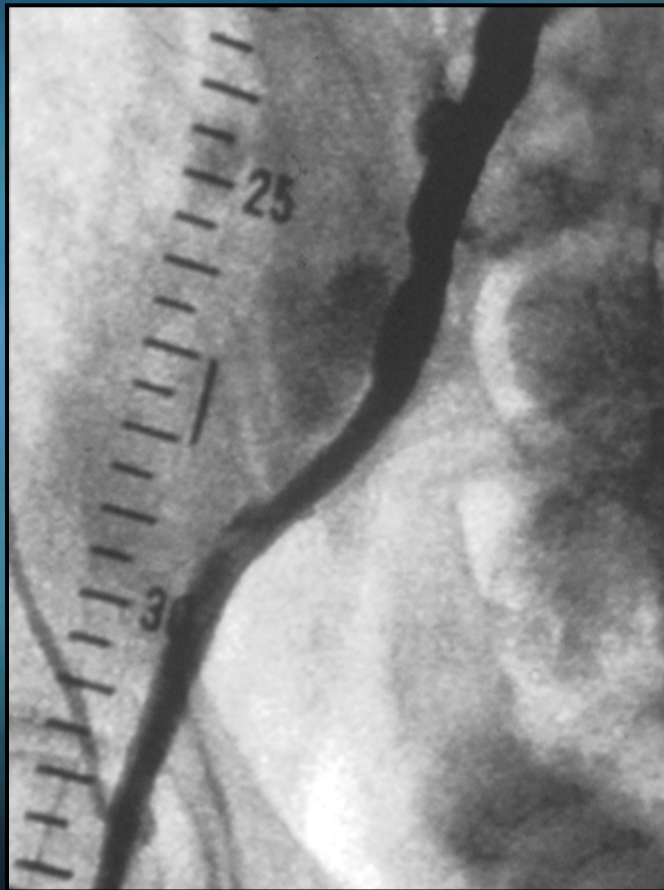
Figure 100-1 CT scan of abdominal aortic aneurysm shows contrast-filled lumen (*) surrounded by thrombus (T) within the aneurysm sac.



Iliac Aneurysms



Iliac Aneurysm Corrections With ELG



- *Be prepared*
- *Occluding balloon-stop hemorrhage*
- *Aortic balloon-occlude inflow*
- *Endoluminal graft*
- *Problem resolved*



ZONA HEART INSTITUTE



Advantages of PTA Over Surgery

- *Excellent success rate*
- *Minimal morbidity and mortality*
- *Diminished length of hospitalization*
- *Minimal and absent recuperative period*
- *Decreased costs (early return to work)*
- *Small penalty for failure*



CONCLUSIONS

AAA Stent Grafts

Exciting alternative to open surgery

Continued interest despite product setbacks

Industry responding with design changes

Various design approaches

