THE VINTAGE VAULT:
Uncovering Aortic Treasures

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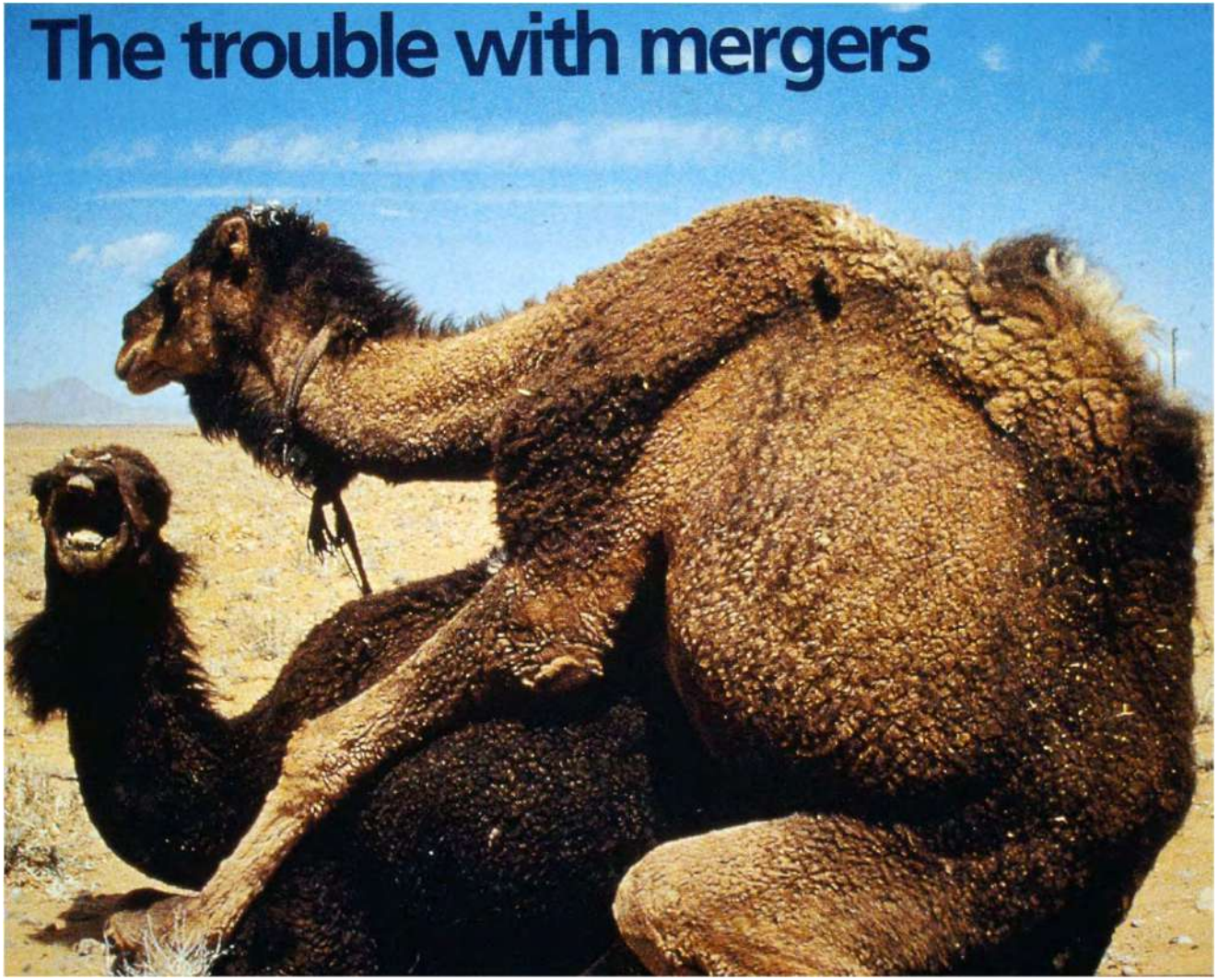
Disclosures

- **Nothing**

- ***Dates***
- ***Safi has not seen this presentation.***

For Early Career Viewers

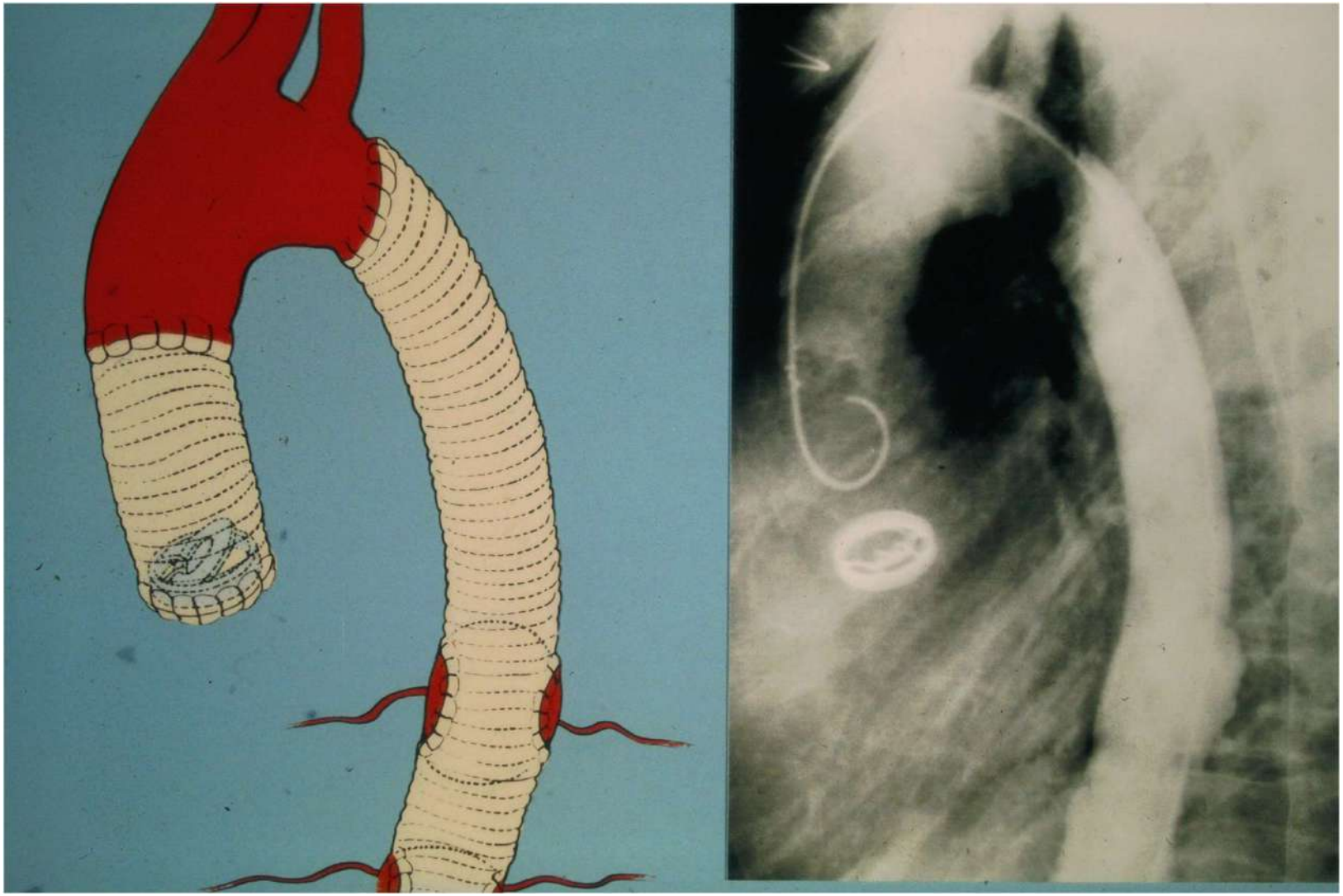

The trouble with mergers

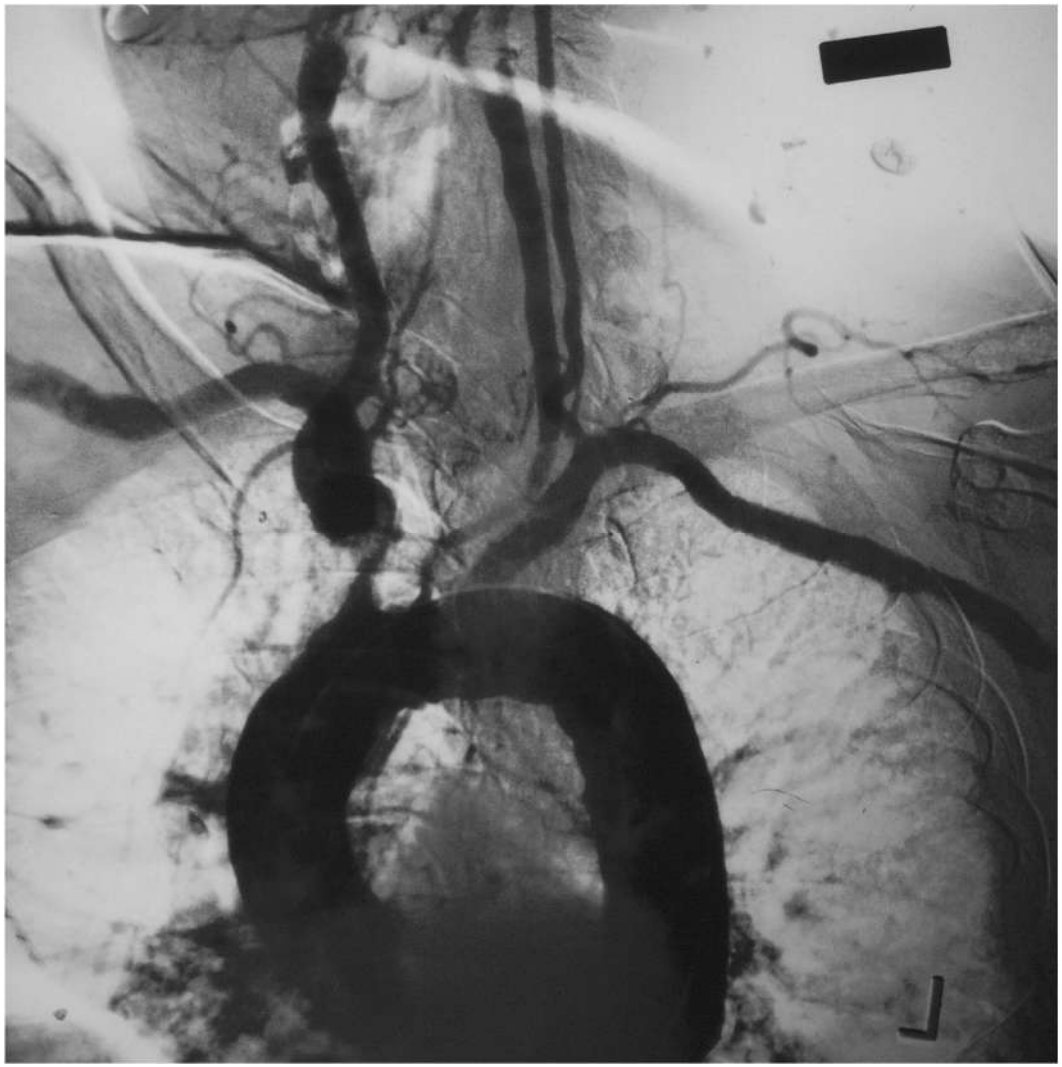

SAFESITE
SAFESITE
SAFESITE
SLIDES
PRIORITY MAIL


Cross Clamp
DA Pressure
CSF Pressure
MAGNASONIC
OK


SAFESITE
INC.
Austin . Dallas / Fort Worth . Houston . San Antonio
LEGAL

Diagnosis





Conduits

CRITERIA FOR SUITABILITY OF SYNTHETIC MATERIALS IN MAMMALIAN TISSUE

1. No physical modification by exposure to tissue fluids
2. Chemical inertness
3. Inertness in respect to foreign body effect
4. Noncarcinogenicity
5. Nonallergenicity
6. Stability under continuous mechanical stress
7. Ease and low cost of fabrication
8. Ease of adequate sterilization

Creech et al; Tenth annual meeting of Society for Vascular Surgery, 1956

SURGICAL TREATMENT OF ANEURYSM OF ABDOMINAL AORTA BY RESECTION AND RESTORATION OF CONTINUITY WITH HOMOGRAFT

Michael E. DeBakey, M.D., F.A.C.S., and
Denton A. Cooley, M.D., F.A.C.S.

Houston, Texas

Surgery Gynecology and Obstetrics
Volume 97 September, 1953 Number 3

THE USE OF TUBES CONSTRUCTED FROM VINYON "N" CLOTH IN BRIDGING ARTERIAL DEFECTS

A Preliminary Report*

Arthur B. Voorhees, Jr., M.D.,
Alfred Jaretzki III, M.D.,
and Arthur H. Blakemore, M.D.
New York, New York

Annals of Surgery March, 1952

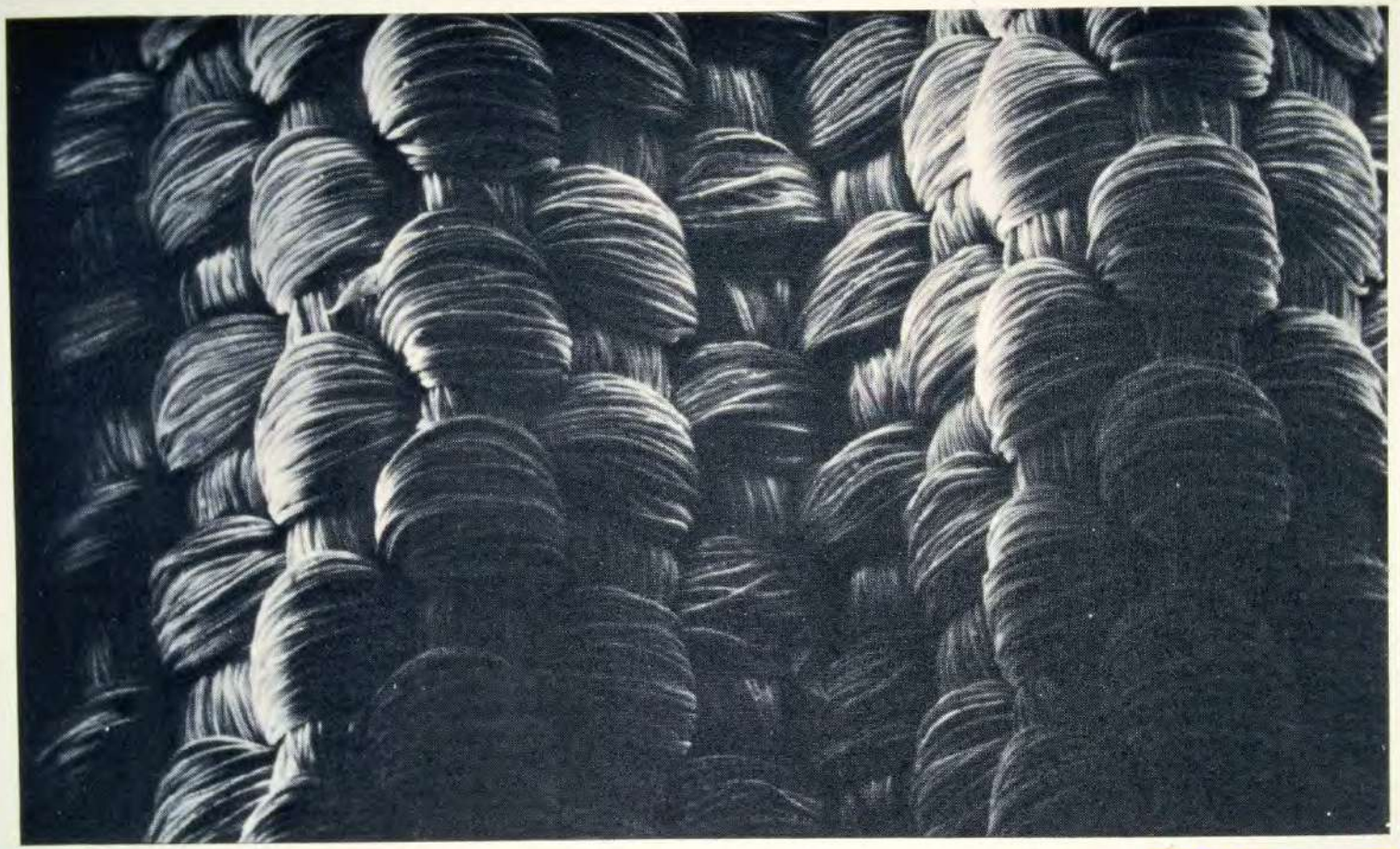
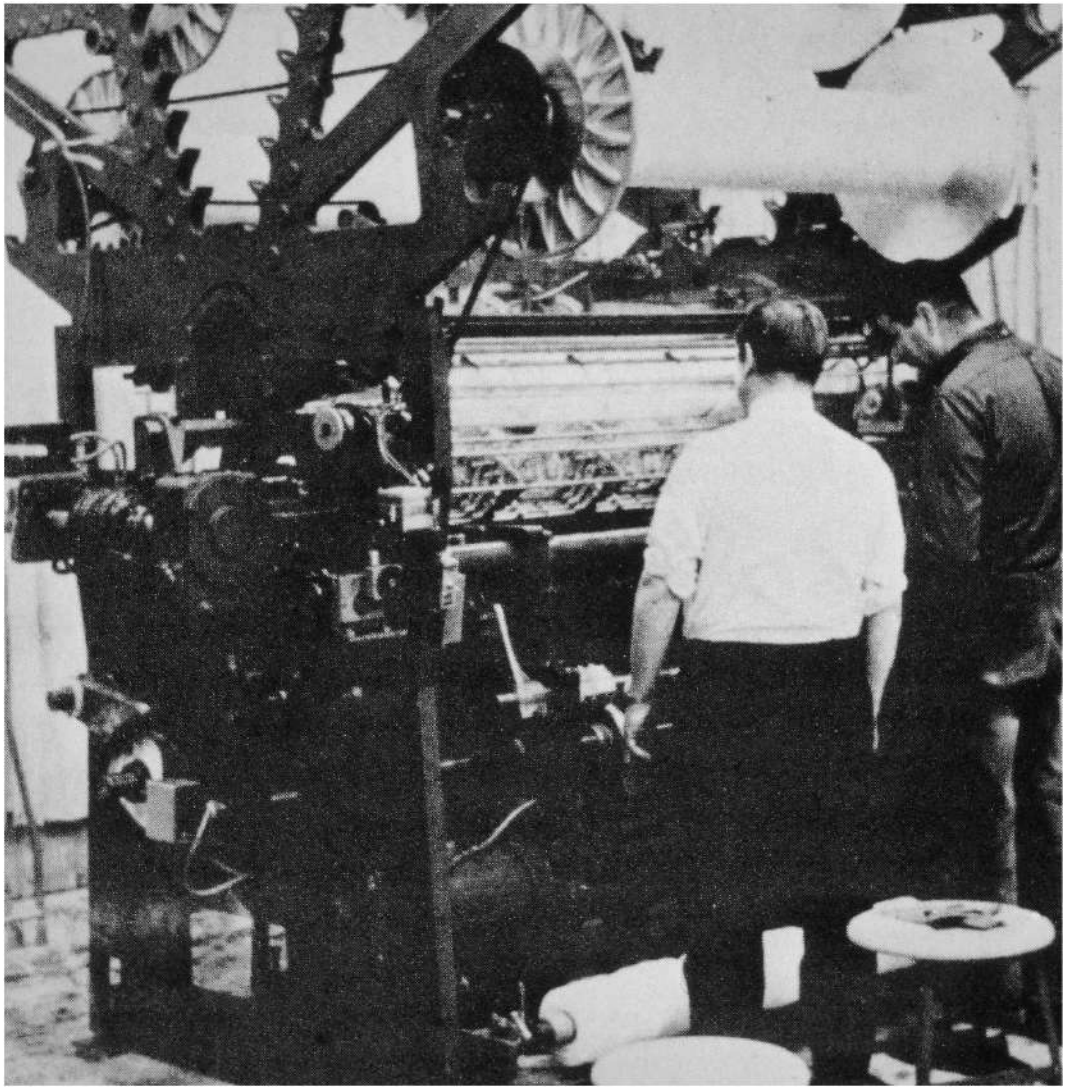


Figure 28-1. Scanning electron micrograph (SEM) of outer surface of DeBakey woven Dacron vascular prostheses (×37).

Figure 28-2. SEM of outer surface of DeBakey standard knit Dacron vascular prosthesis (× 37).



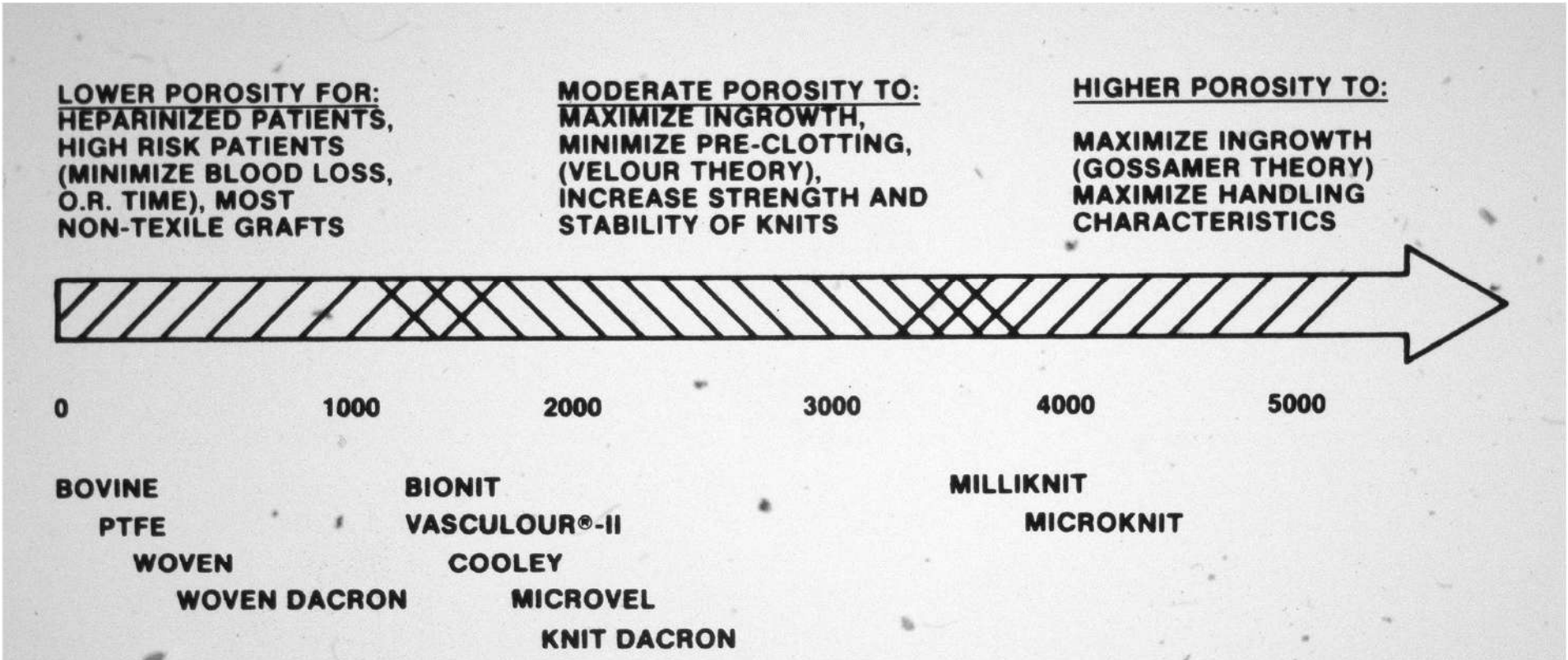
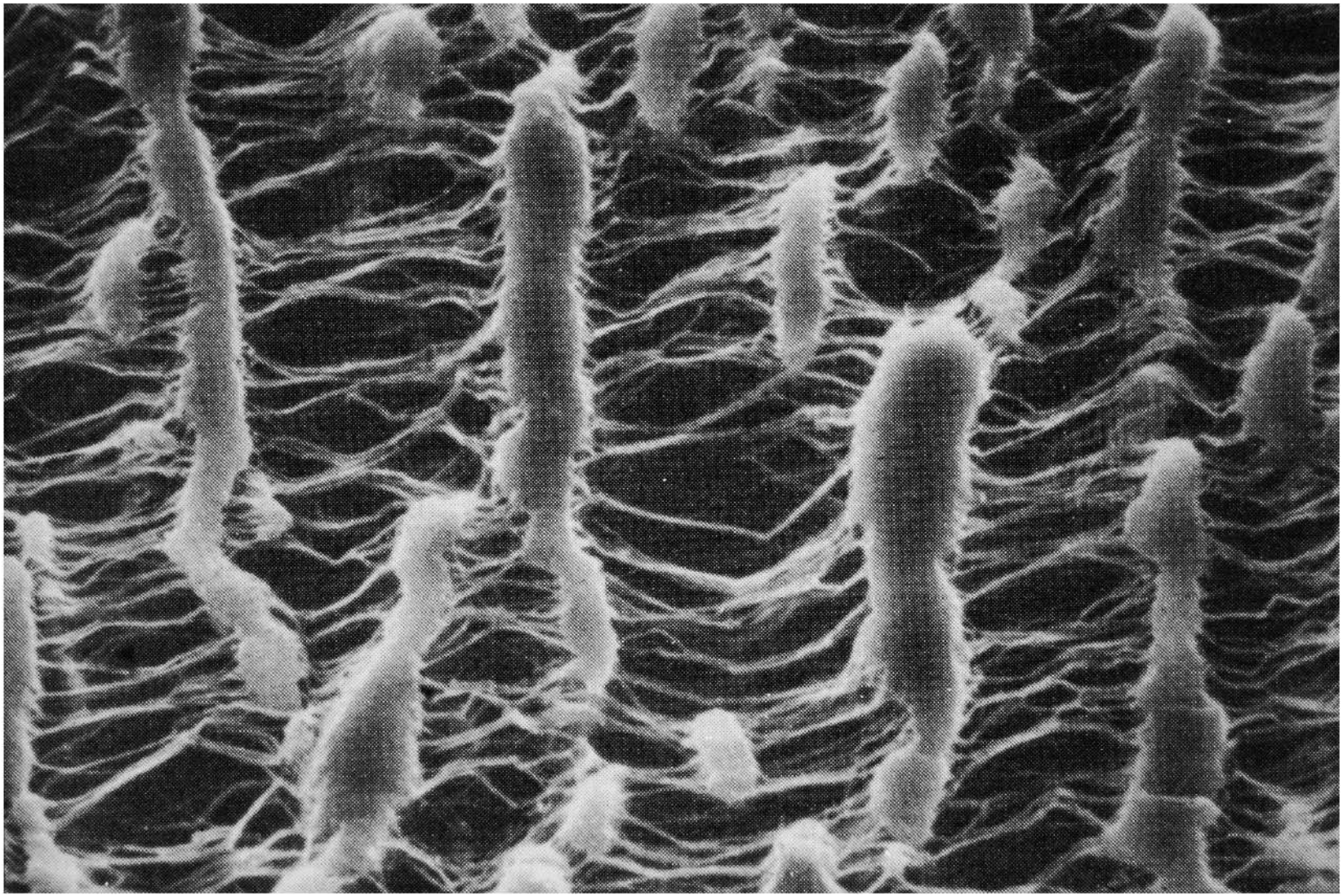
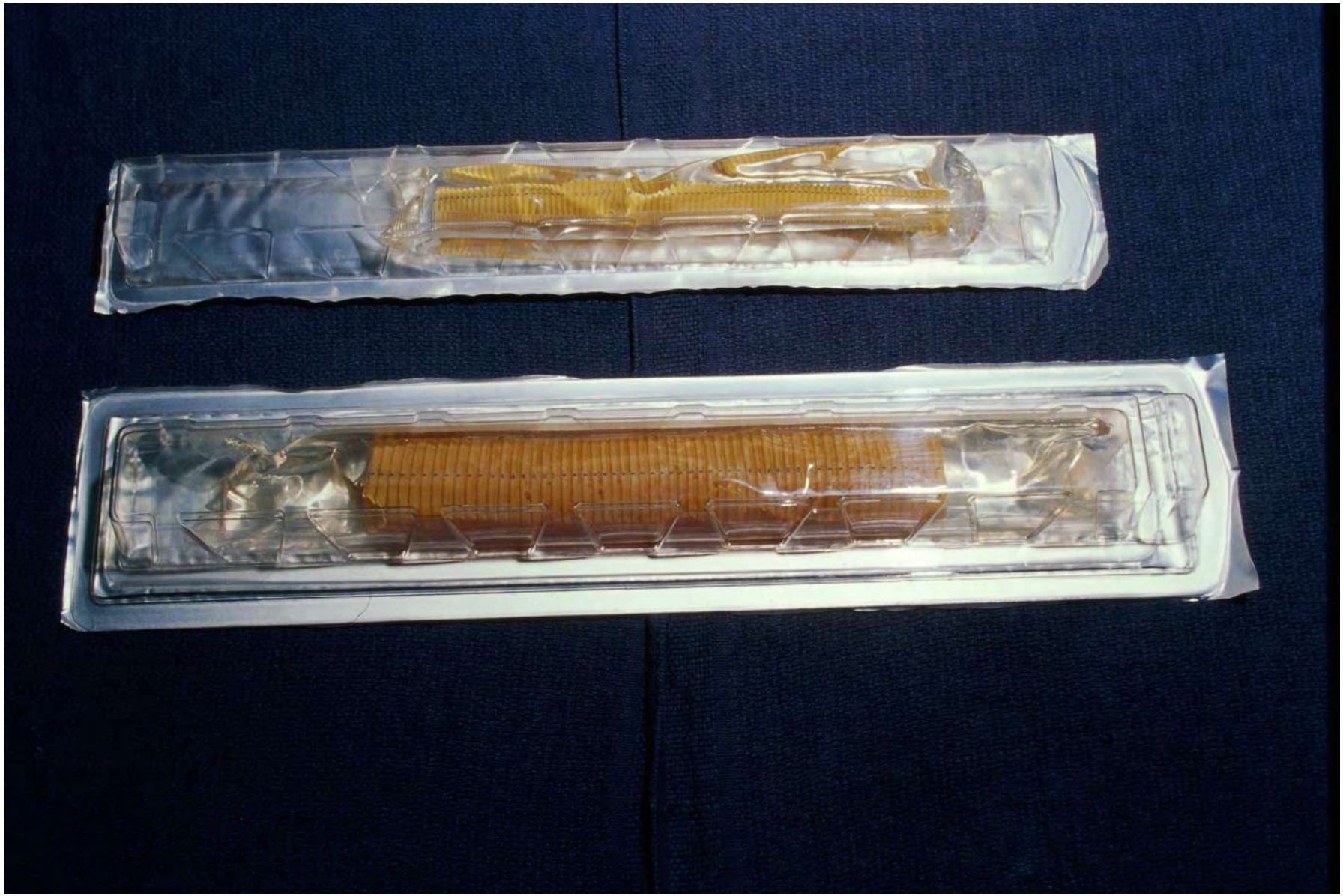


Figure 28-4. Range of typical porosities for commercially available vascular prostheses in $cc/cm^2/min\ H_2O$ at 120 mm Hg.

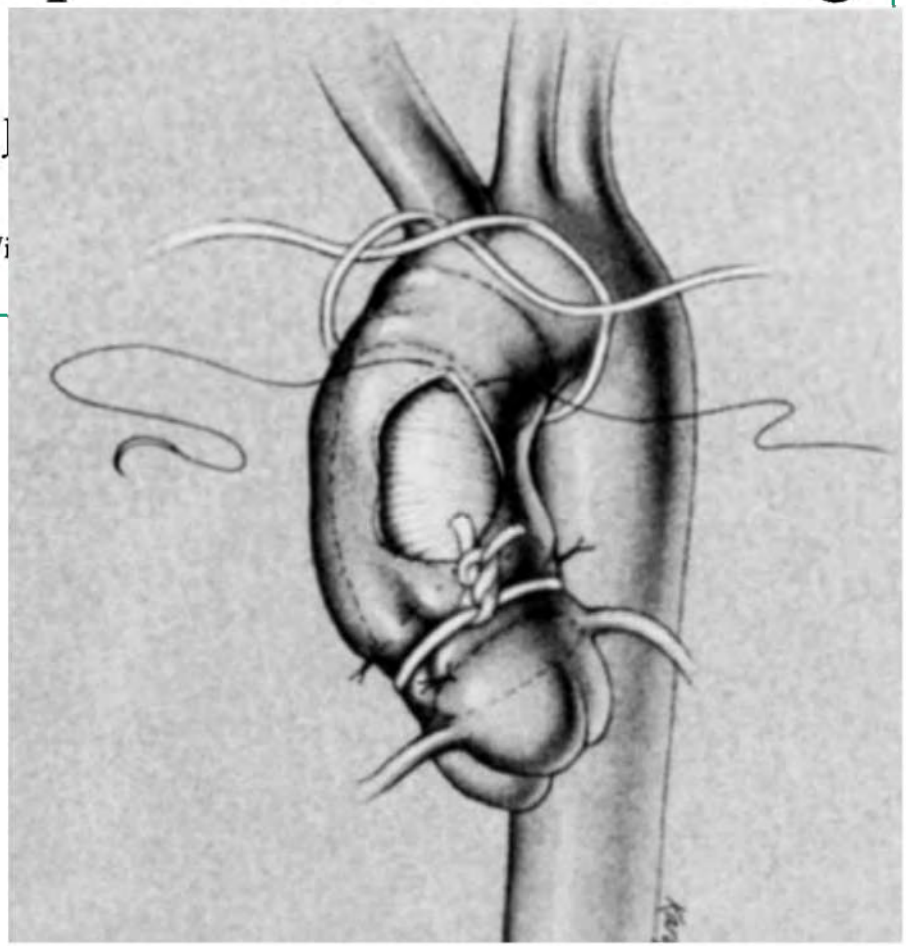




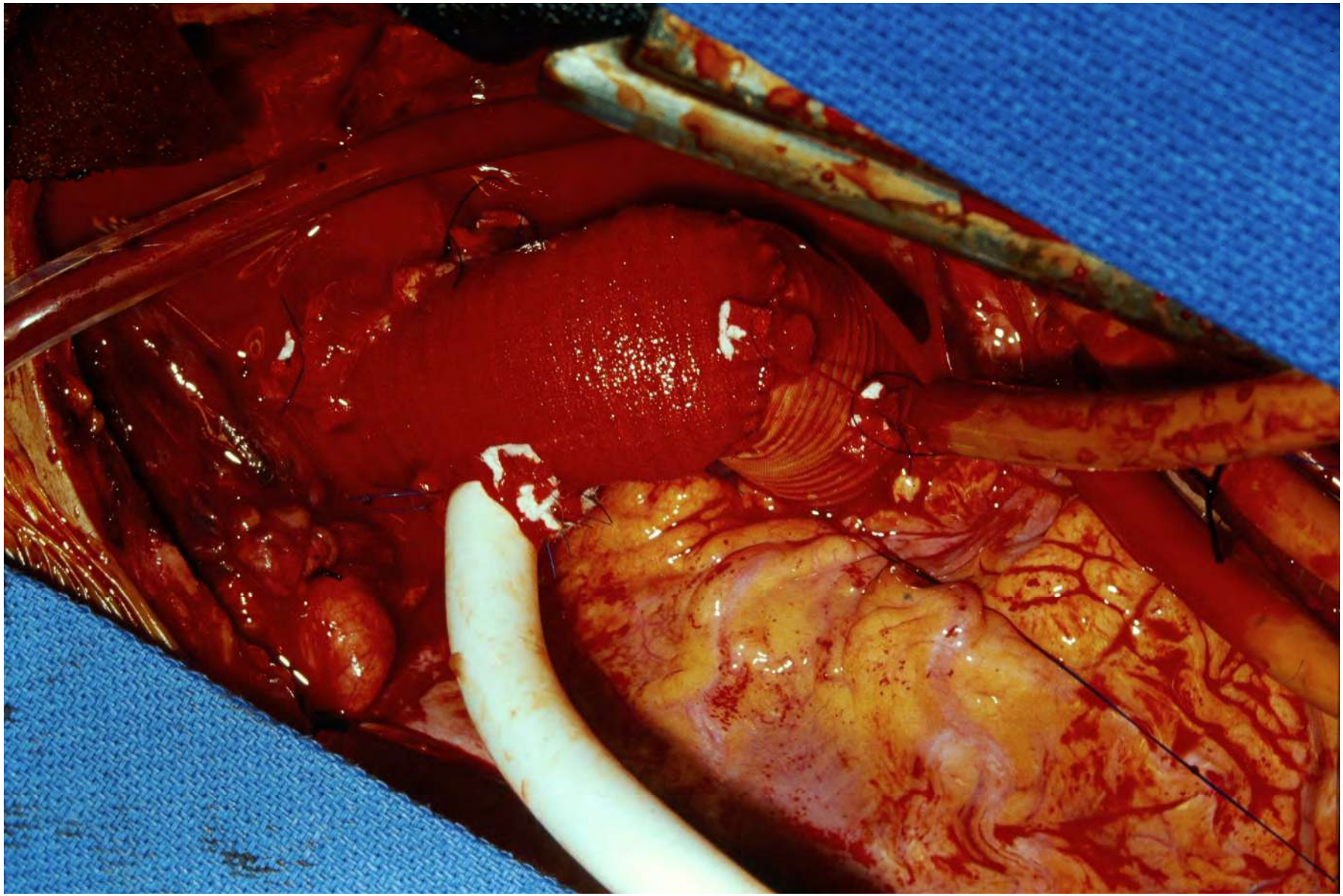
Sutureless Ring Graft Replacement of Ascending Aorta and Aortic Arch

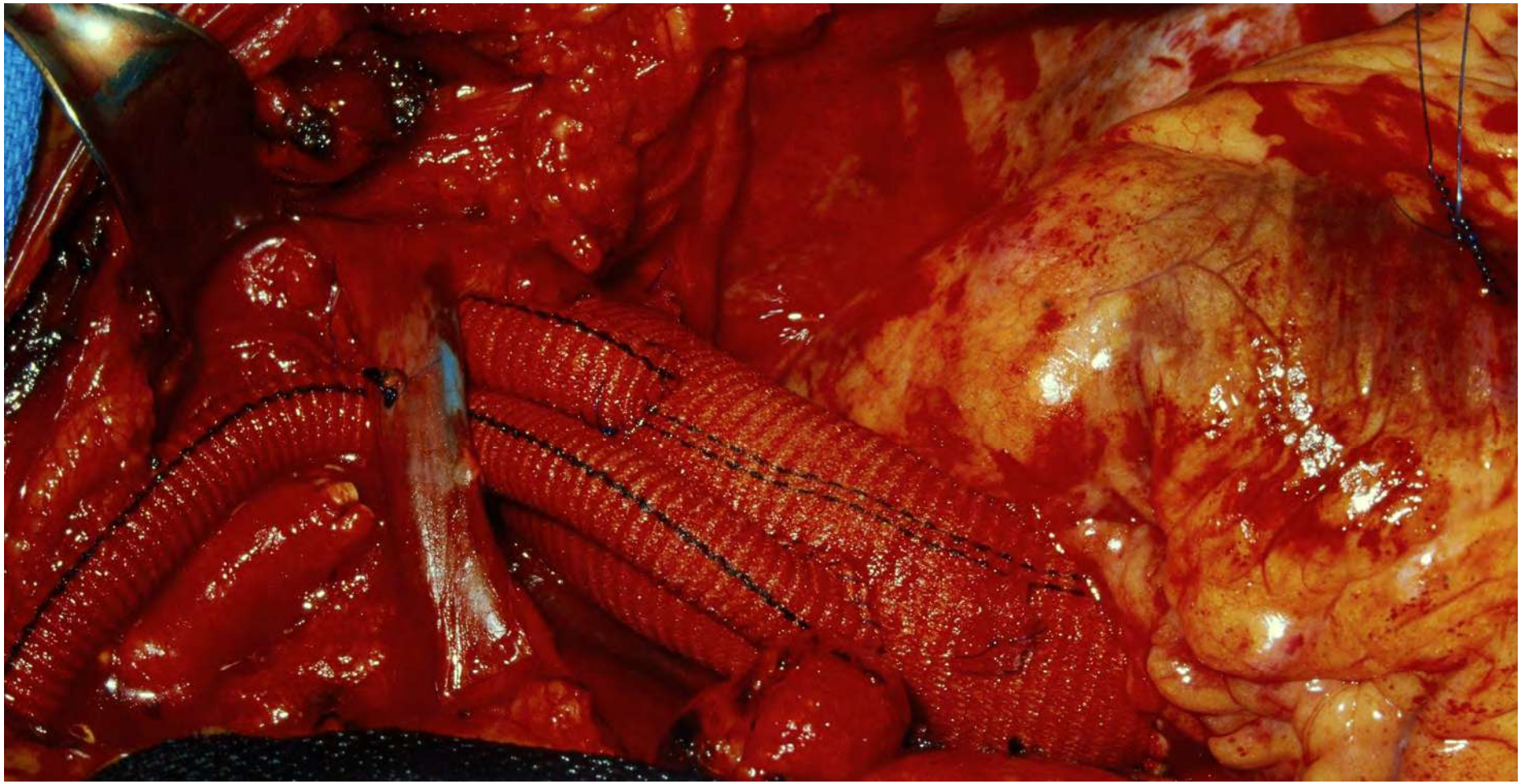
Mehmet C. Oz, MD, Robert C. Ashton, J
Gerald M. Lemole, MD

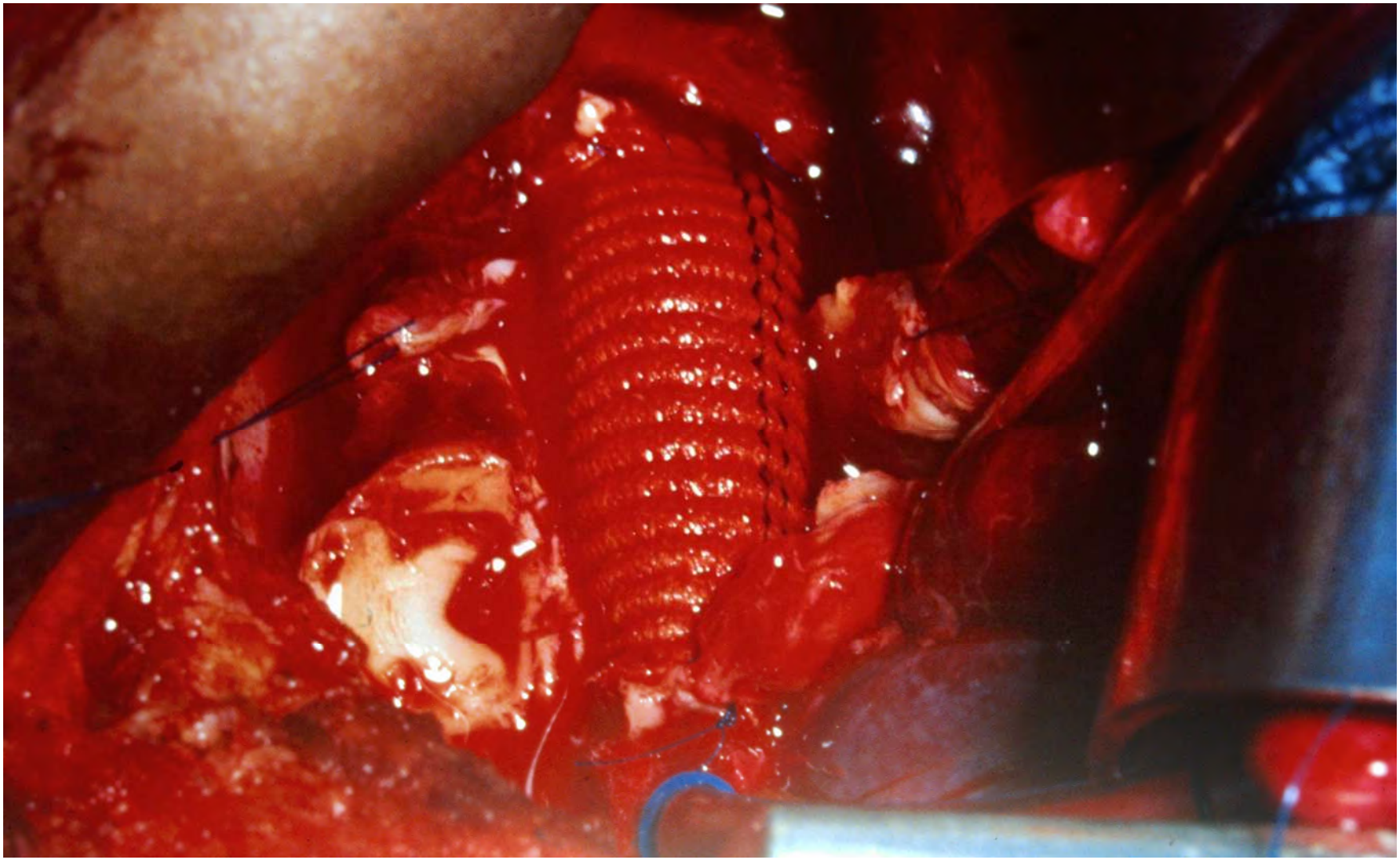
Department of Surgery, The Medical Center of Delaware, Wi
Presbyterian Medical Center, New York, New York

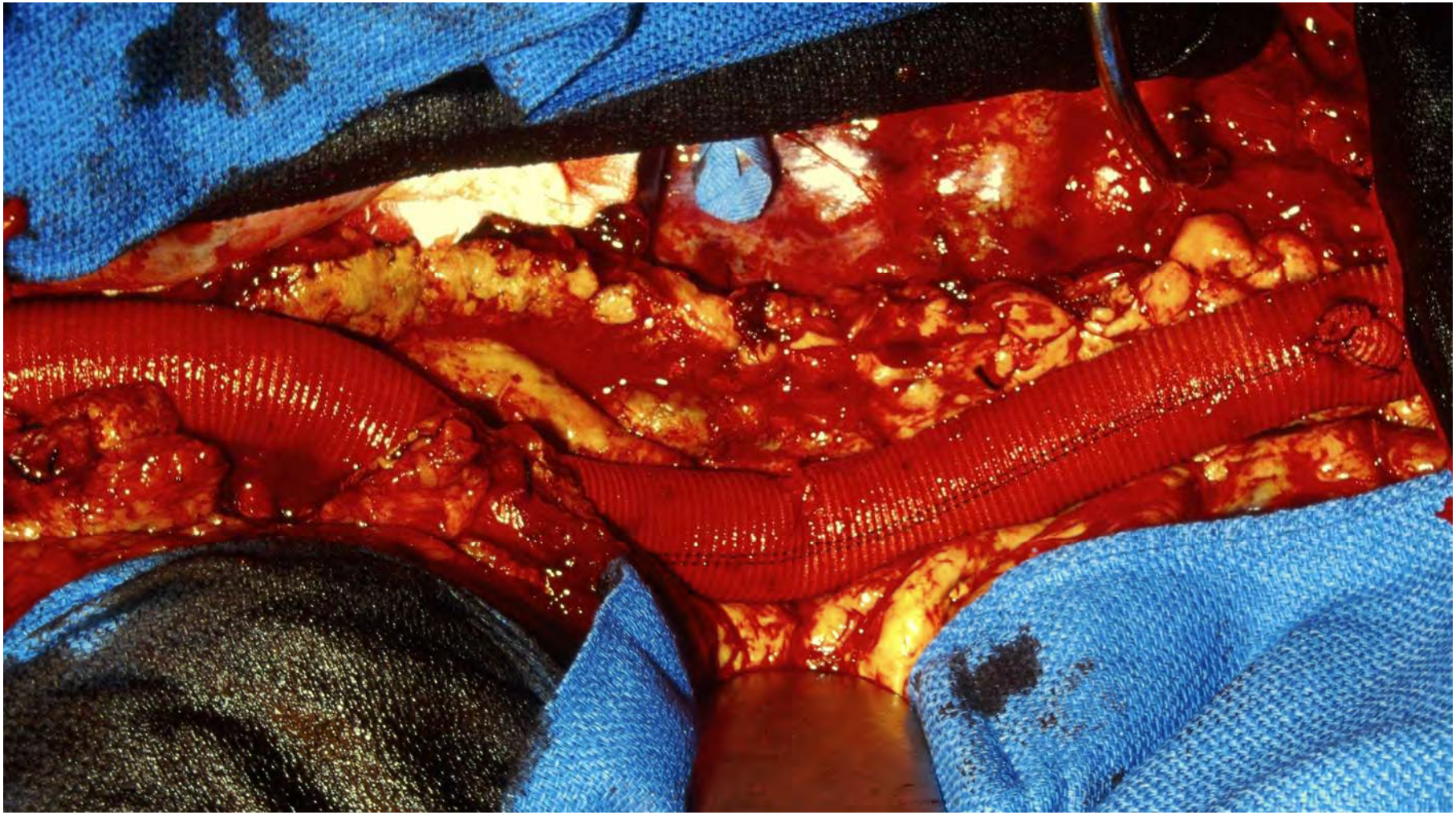


(Ann Thorac Surg 1990;50:74–9)

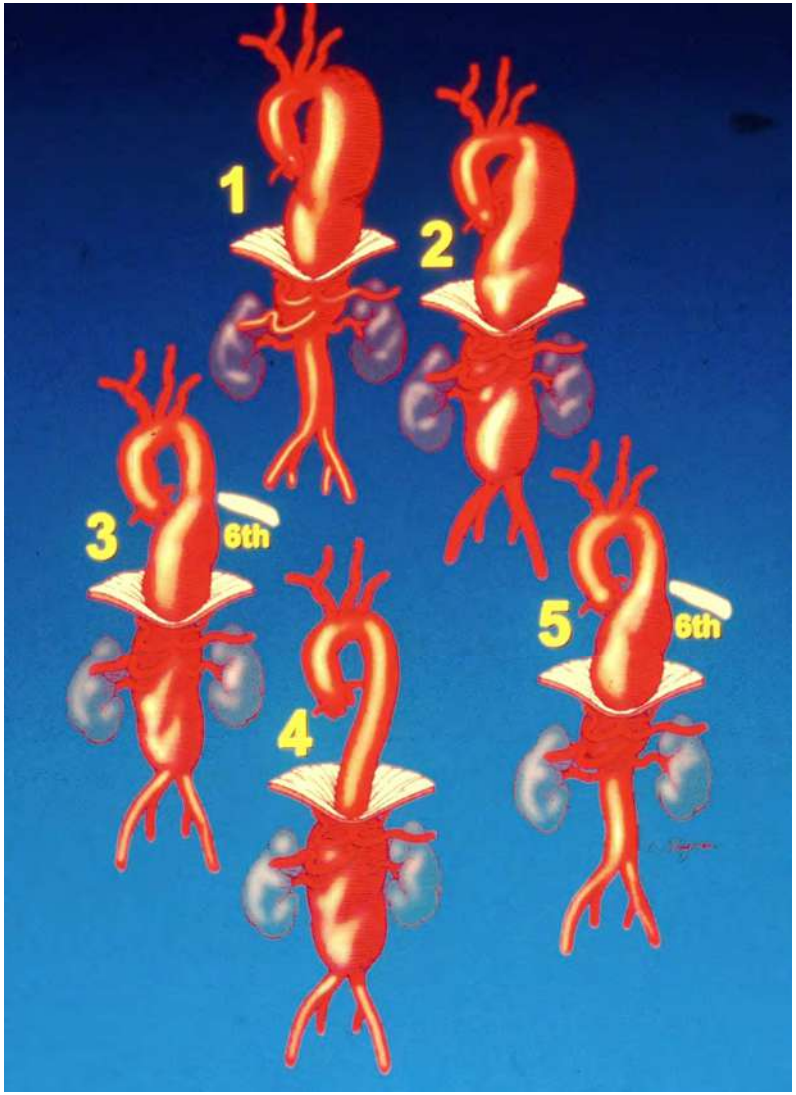






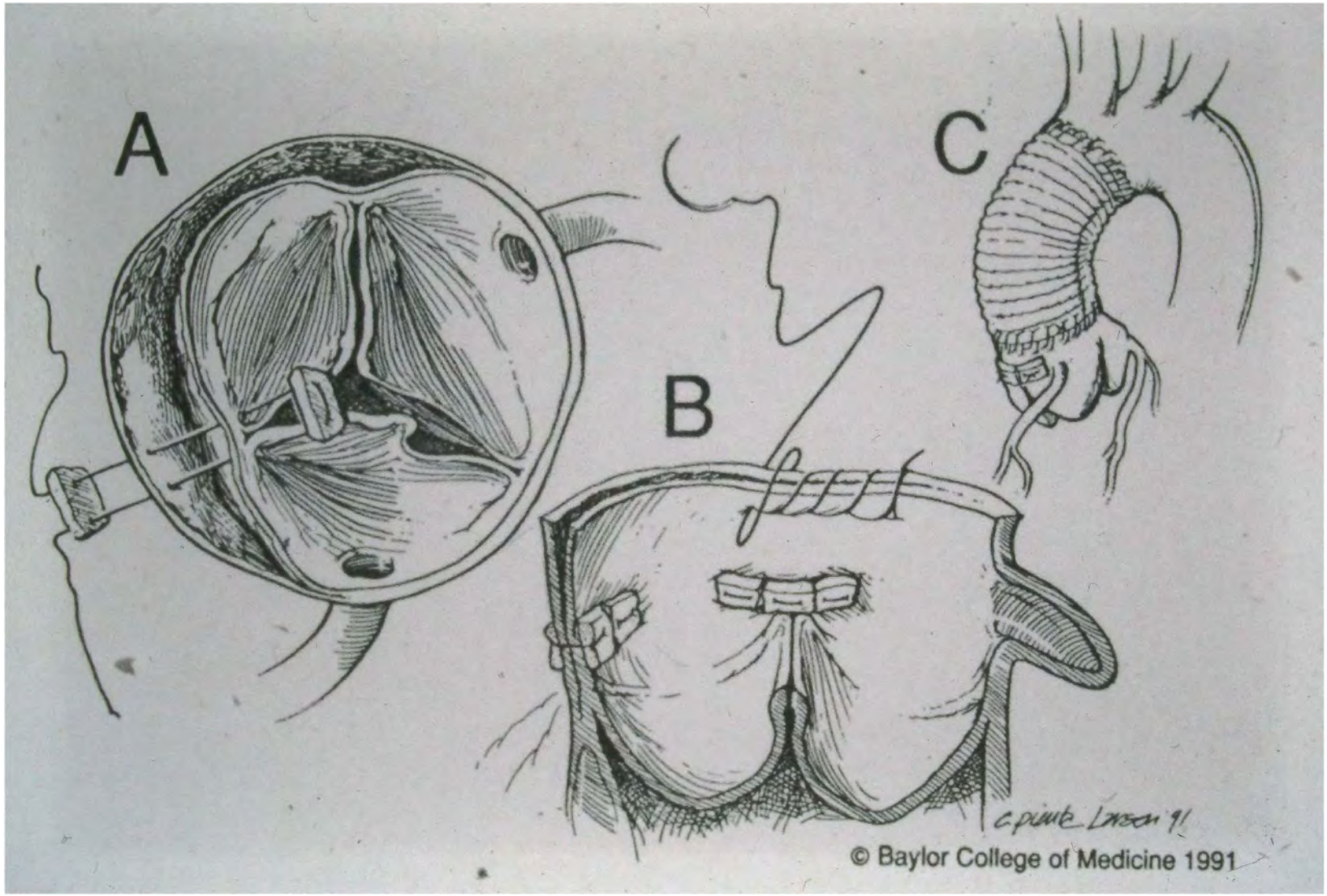


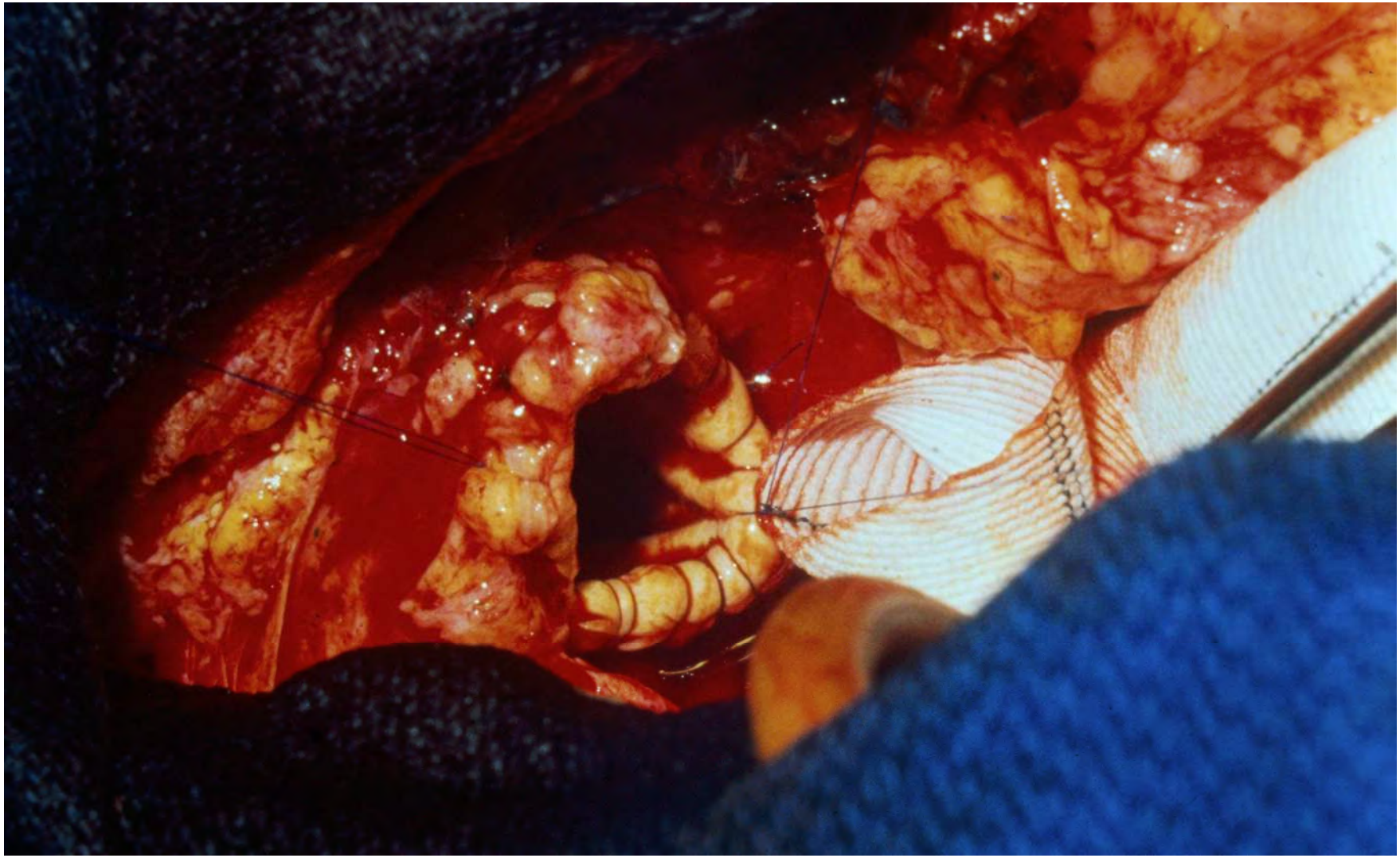
Szilagyi pointed out in his 1981 Matas Memorial Lecture, the development of arterial substitutes was not the result of a careful scientific study of established histologic and physiologic properties of the human artery, but rather was the product of the intuitive attempts of innovative surgeons. "The surgeon disregarded scientific logic and, propelled by intuition and curiosity, he achieved a surprising degree of practical success."



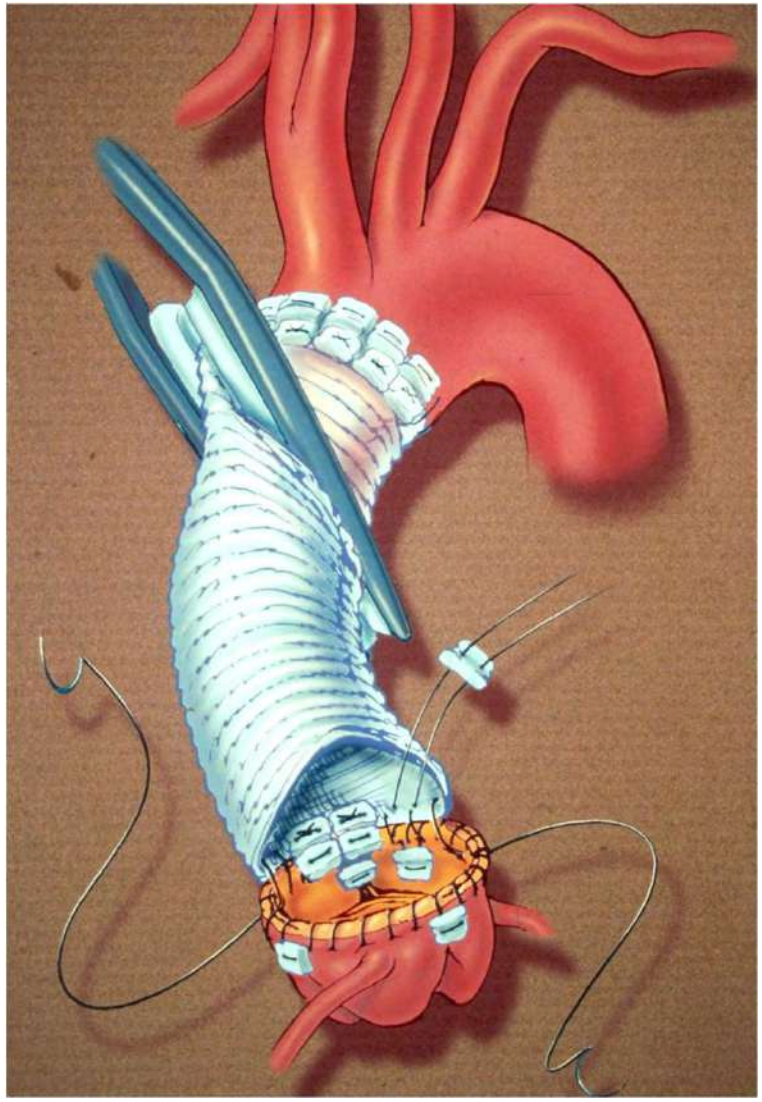
1996

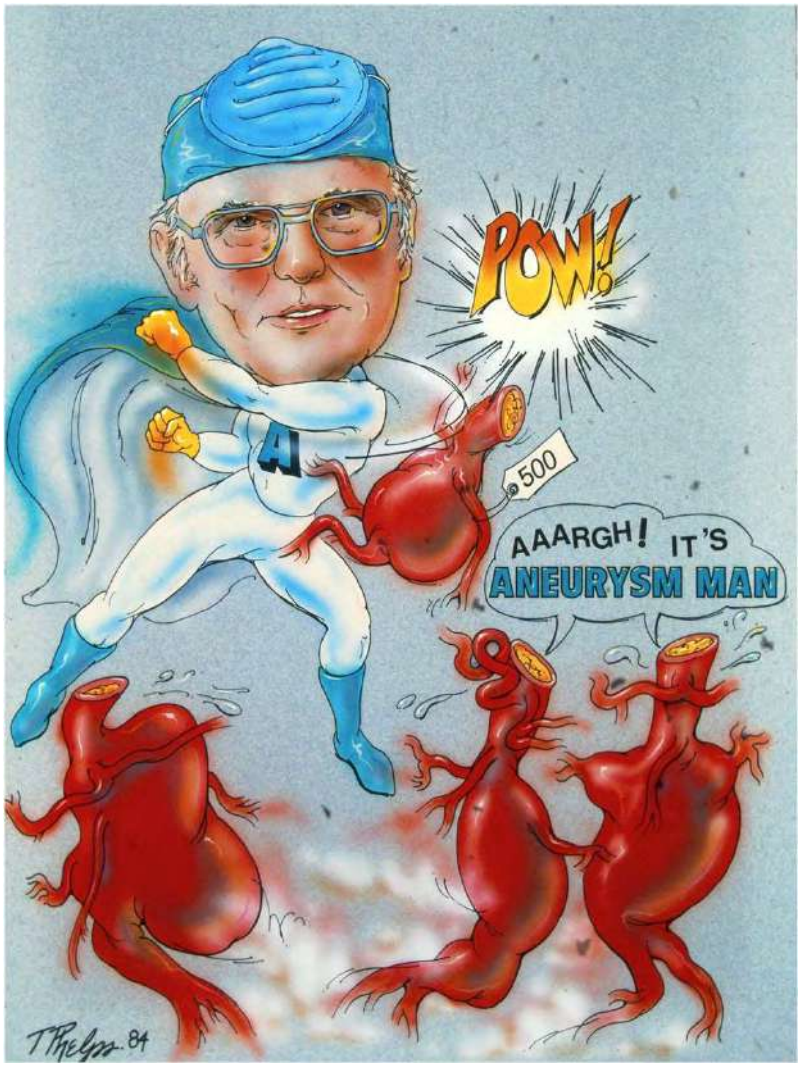
Technique


A
B
C
© Baylor College of Medicine 1991

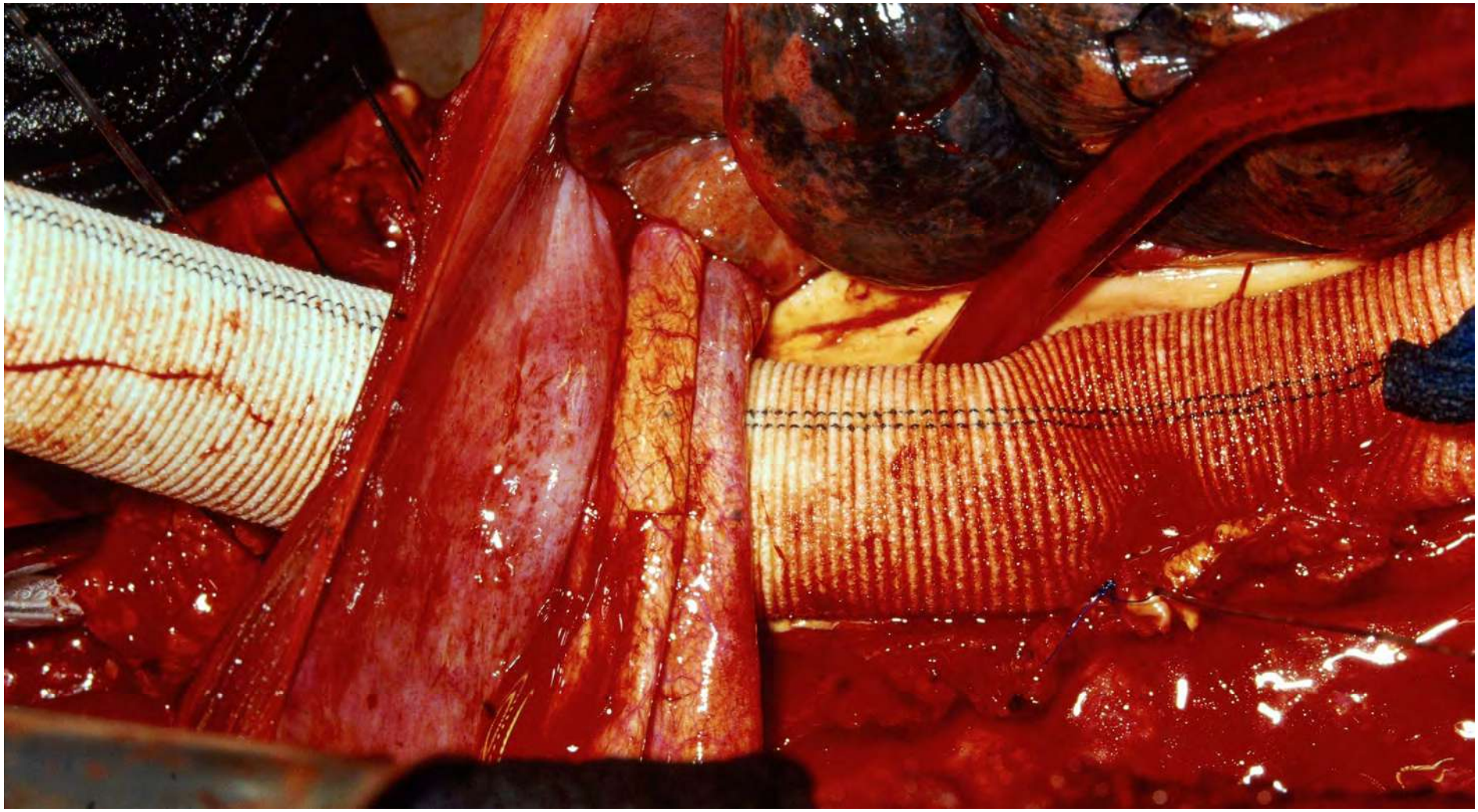


Safi Stitch

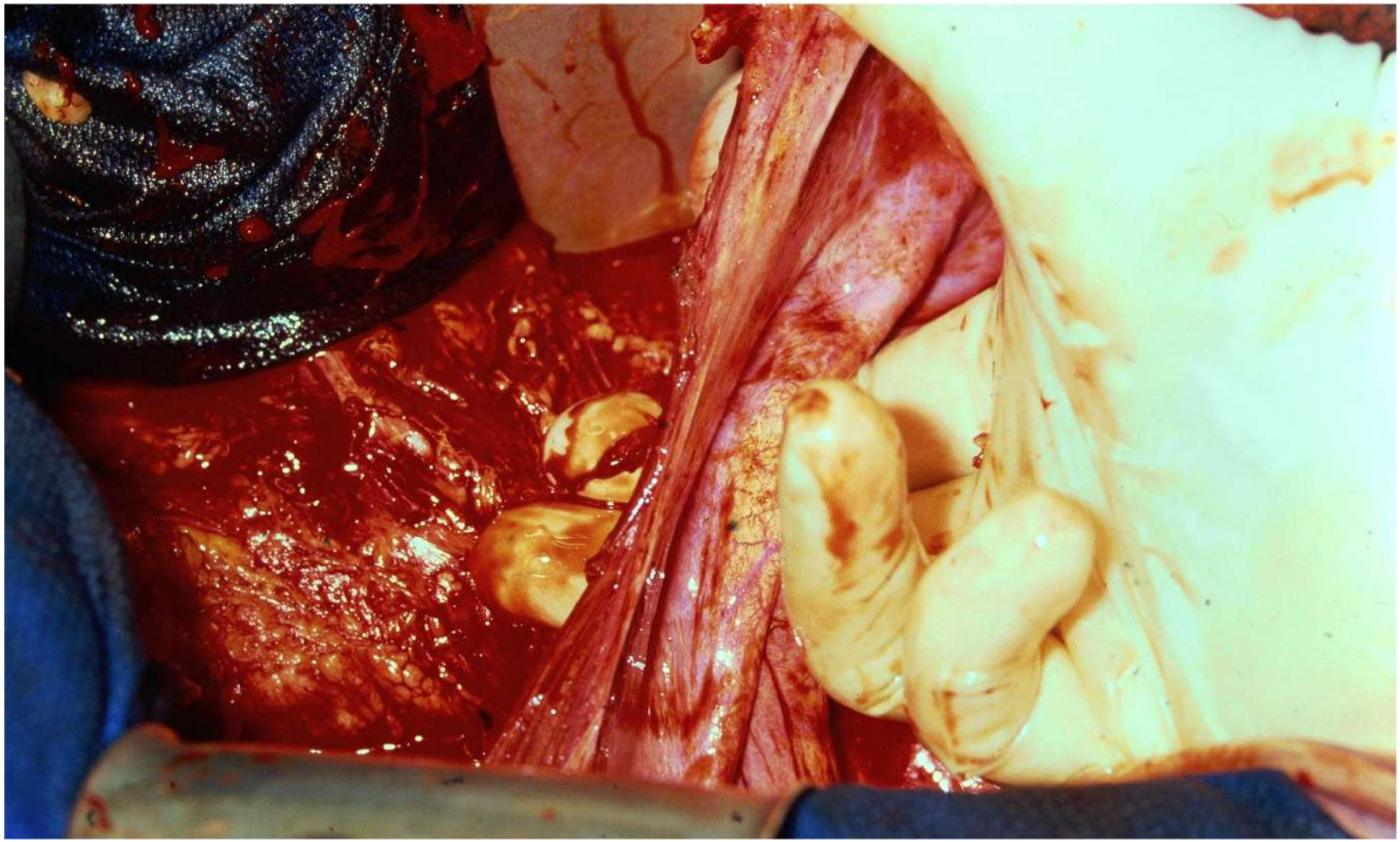


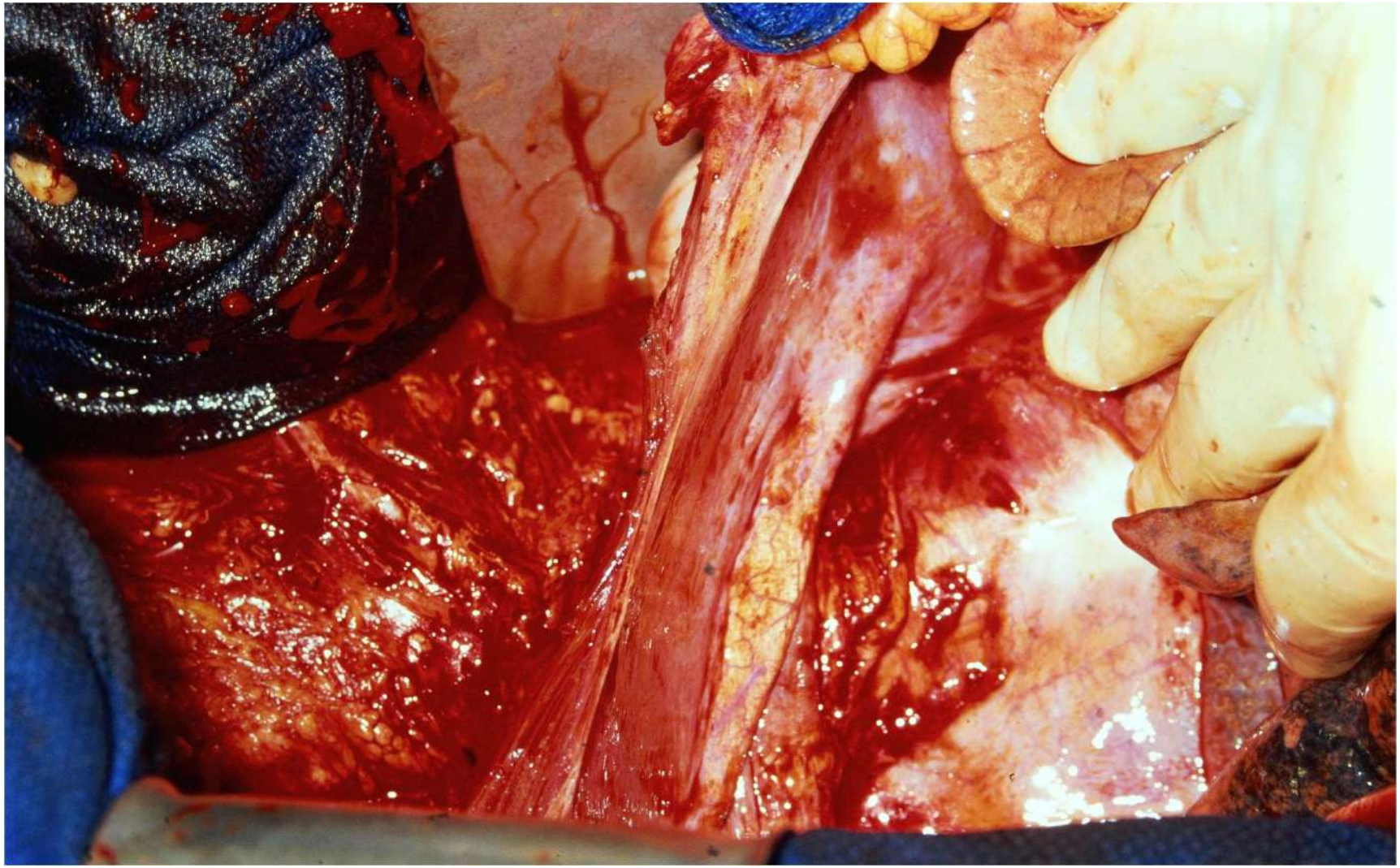


1984



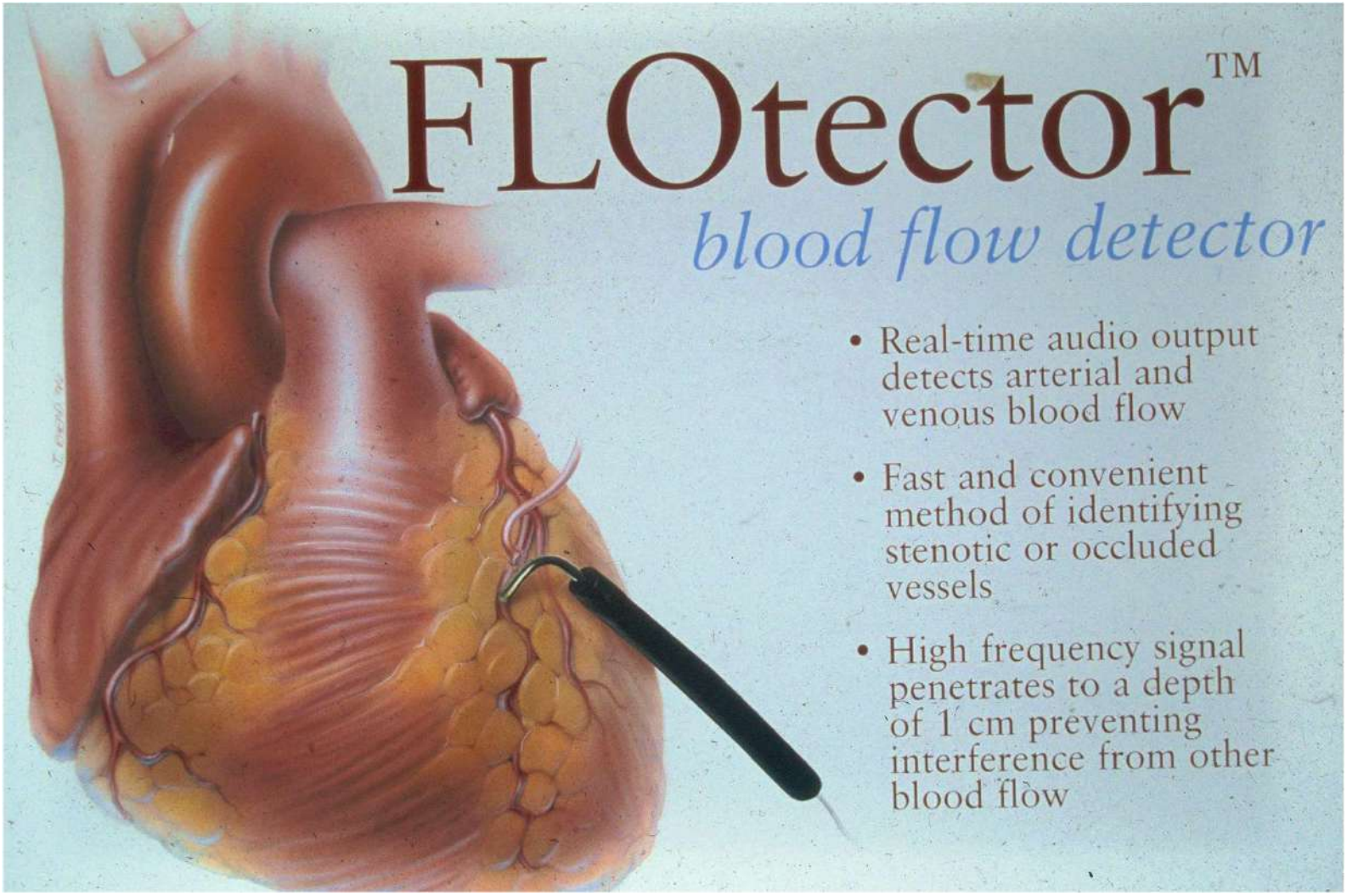
1996



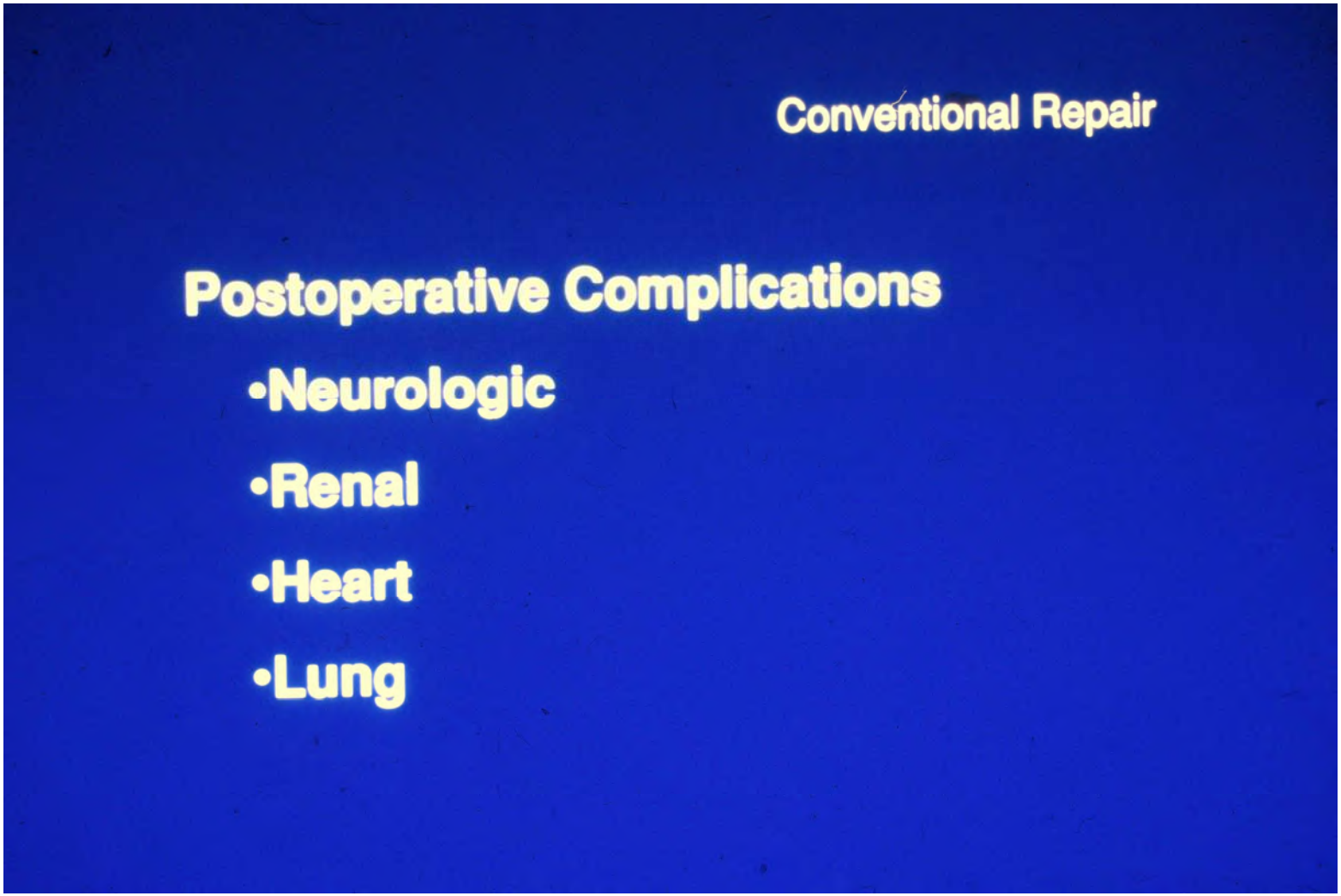


CONCLUSION

"Independently of well-known pulmonary risk factors, an intact diaphragm during TAAA repair results in a higher probability of early ventilator weaning."


FLOtector™
blood flow detector
• Real-time audio output detects arterial and venous blood flow
• Fast and convenient method of identifying stenotic or occluded vessels
• High frequency signal penetrates to a depth of 1 cm preventing interference from other blood flow

1996


Conventional Repair
Postoperative Complications
•Neurologic
•Renal
•Heart
•Lung

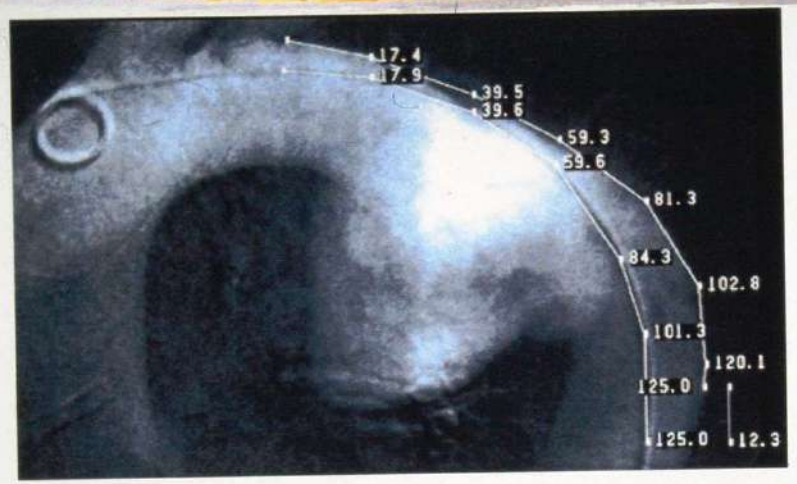
1997

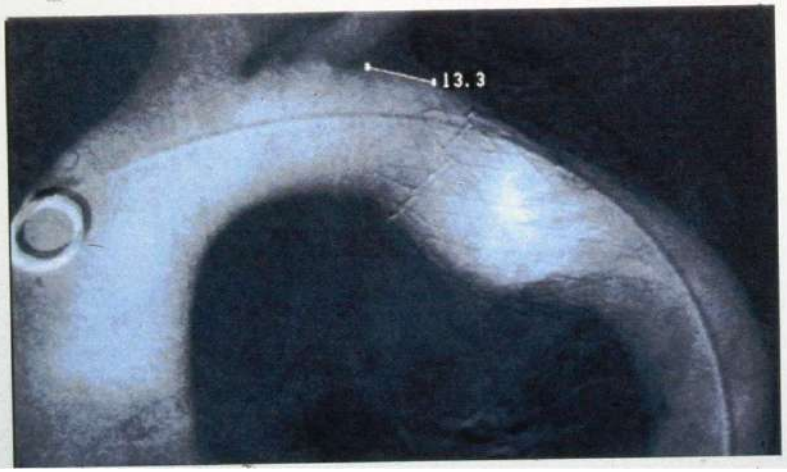
Endovascular Repair

Materials

- Endoprosthesis
- Delivery Catheter
- Deployment System
- Balloon Catheter

Inner vs. Outer Curve



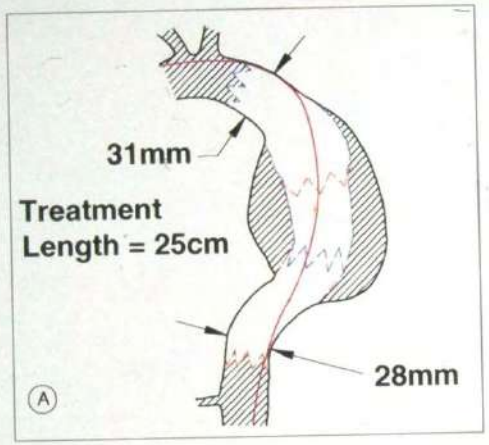


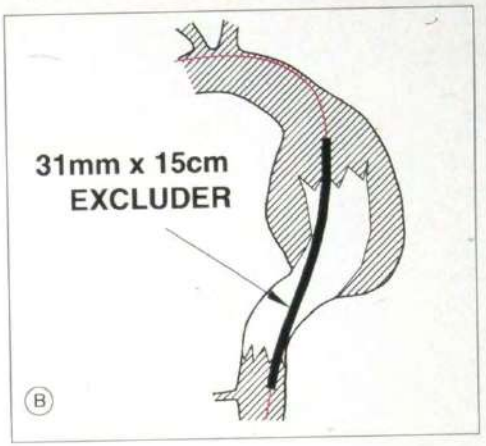
Sizing Chart

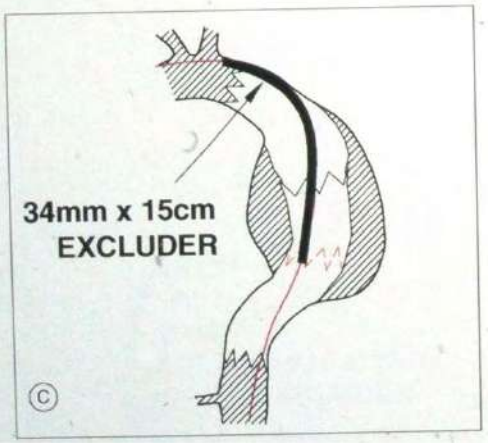
Vessel iameter (CT) [mm]	Endoprothesis Diameter* [mm]	Lengths [cm]					Introducer Sheath [F]
		7.5	**10.0**	**12.5**	**15.0**	**20.0**	
23 - 24	**26**	✓	✓	✓			22
24 - 26	**28**	✓	✓	✓	✓		22
26 - 29	**31**	✓	✓	✓	✓		22
29 - 32	**34**		✓	✓	✓	✓	24
32 - 34	**37**		✓	✓	✓	✓	24
34 - 37	**40**		✓	✓	✓	✓	24

versizing is 7-18%

Overlapping Two Devices







Diameter Measurements with CTs

- CT for ALL diameters
- 3mm cuts
- CT to scan from the origin of the great vessels to below the celiac artery.
- CT to scan access sites (iliac and femoral arteries).
- If neck is angulated, then measure the smaller width of the ellipse; if not, use the larger diameter (see next page).
- May supplement diameter measurement with marker catheter.

Measurement Techniques

- Diameter / Lengths
- Aneurysm
- Proximal and Distal Necks
- Access Site

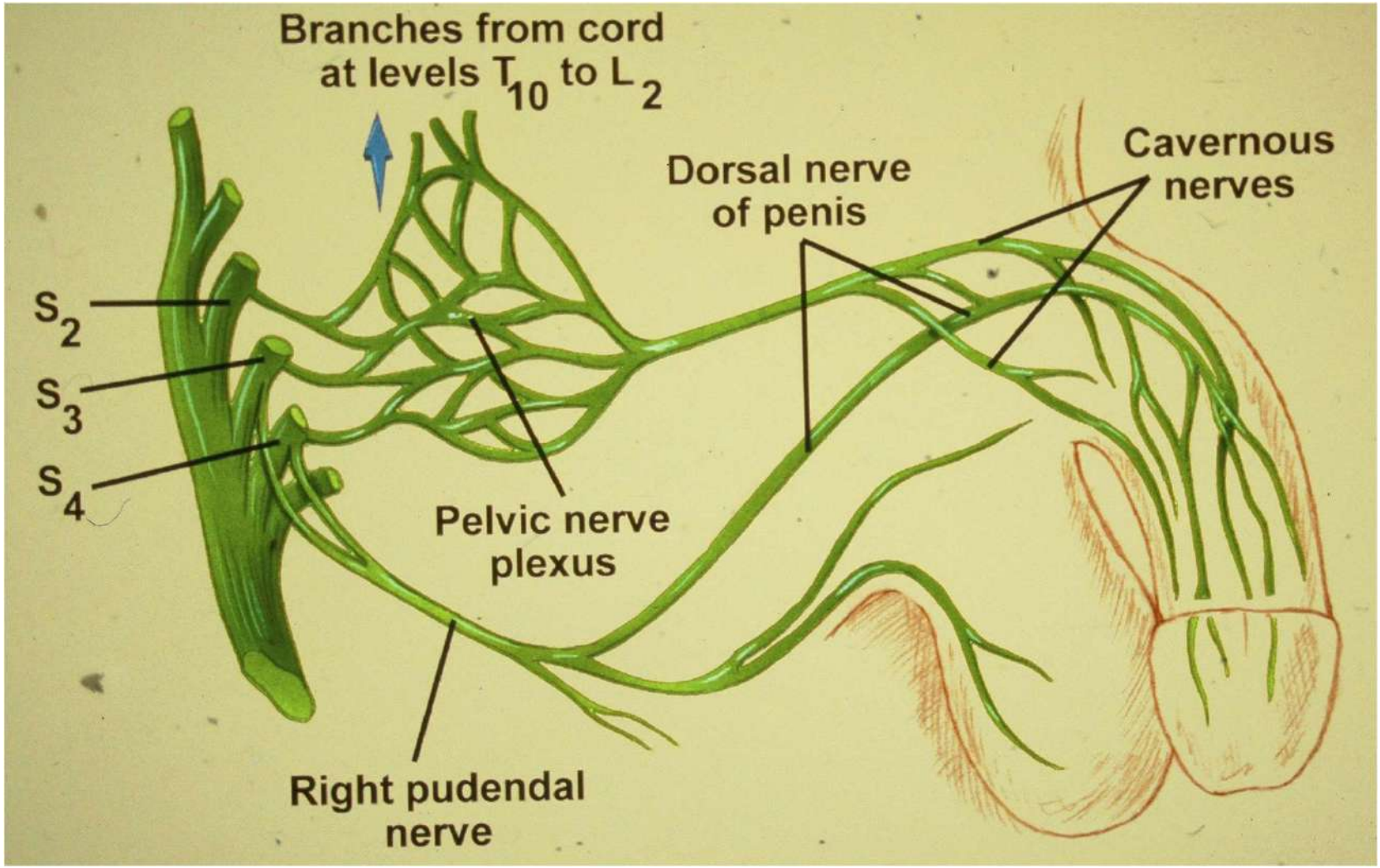
Overview of Anatomical Requirements

- Proximal and Distal neck lengths: > 2cm
- Additional neck length if severe angulation is present (<60°).
- Proximal and Distal neck diameters: 23 - 37mm
- Femoral and Iliac diameters: appropriate for introducer sheath.
  - Note: May access via infra-renal aorta.
- No significant thrombus in proximal and distal necks.

Endovascular Repair

Predominant complications - Abdominal Aneurysm

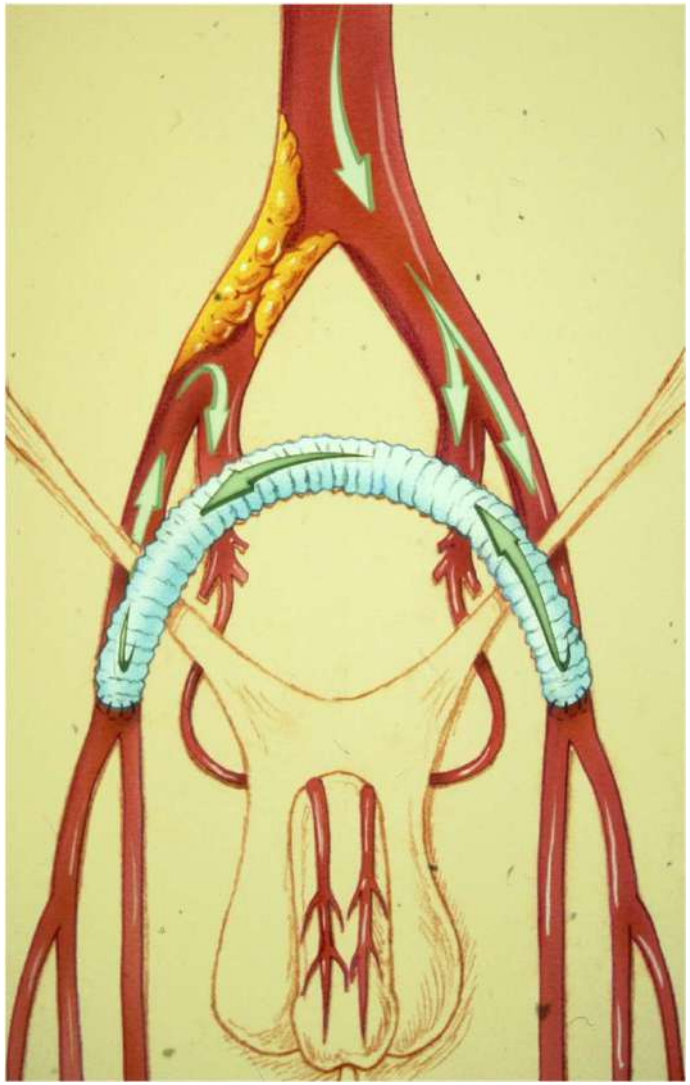
- **Endoleak (10-50% varies by location)**
- **Graft limb obstruction (15%)**
- **Continued aneurysm dilation (10%)**

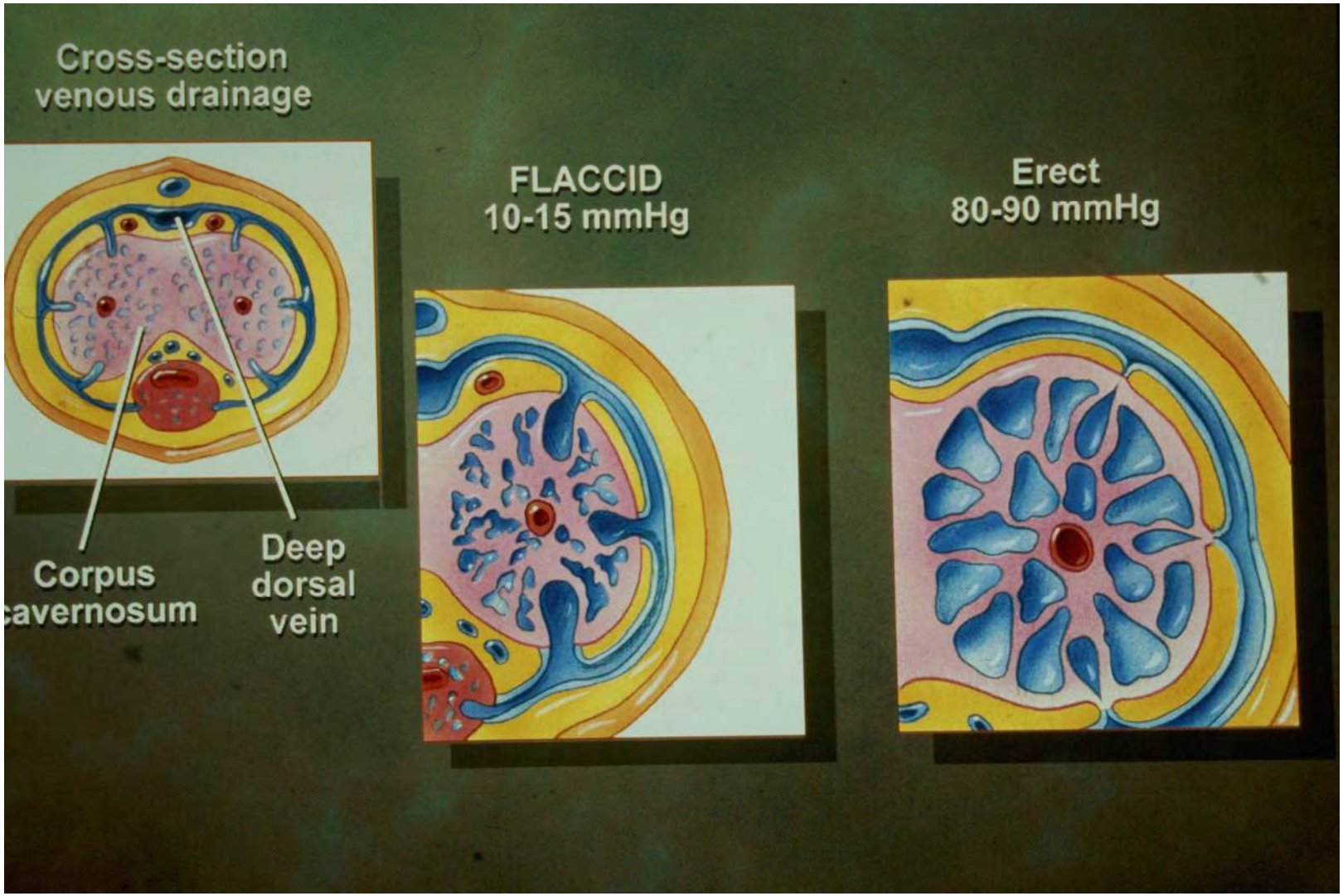

Branches from cord at levels T_{10} to L_2
Dorsal nerve of penis
Cavernous nerves
S_2
S_3
S_4
Pelvic nerve plexus
Right pudendal nerve

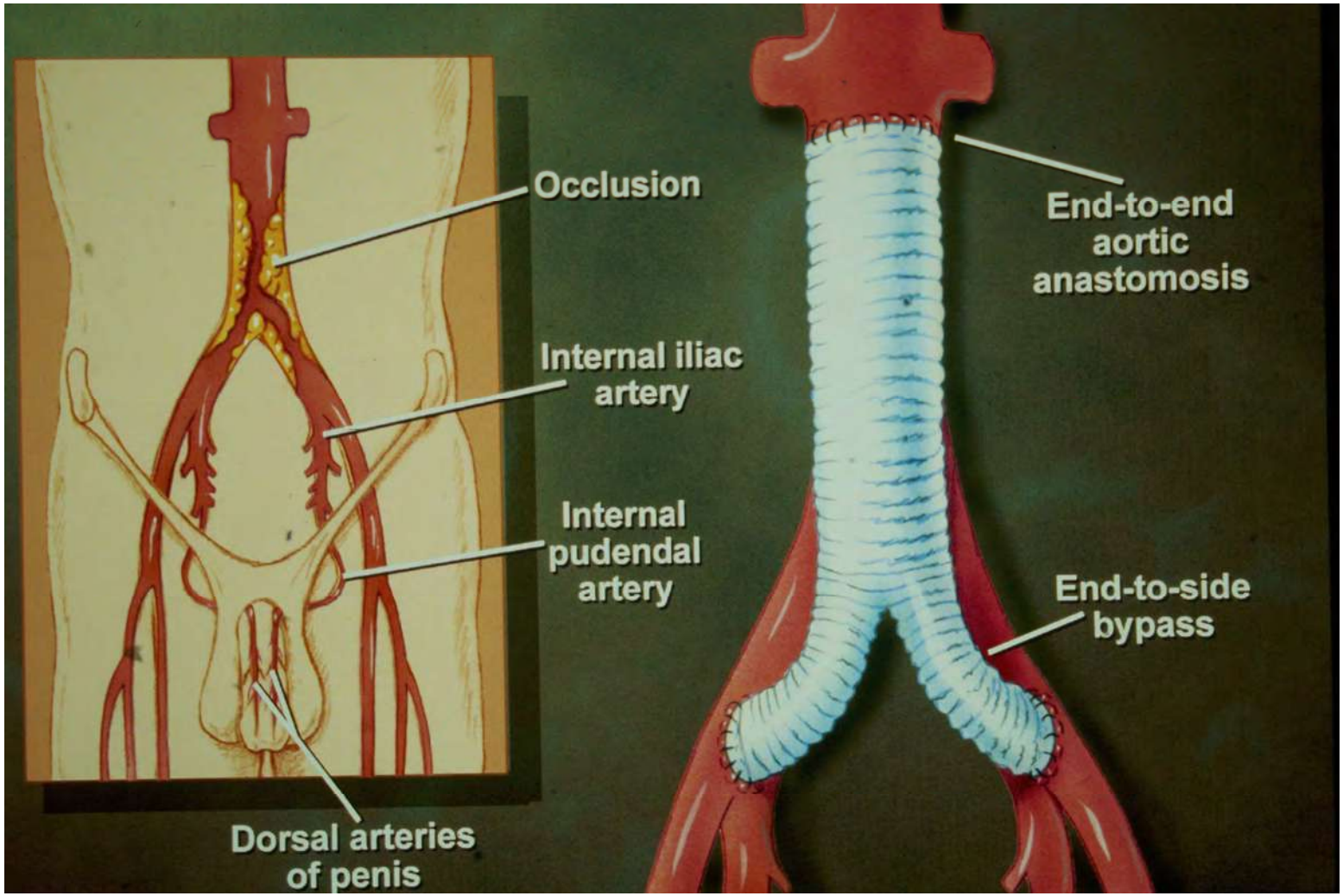
Aortoiliac Surgery

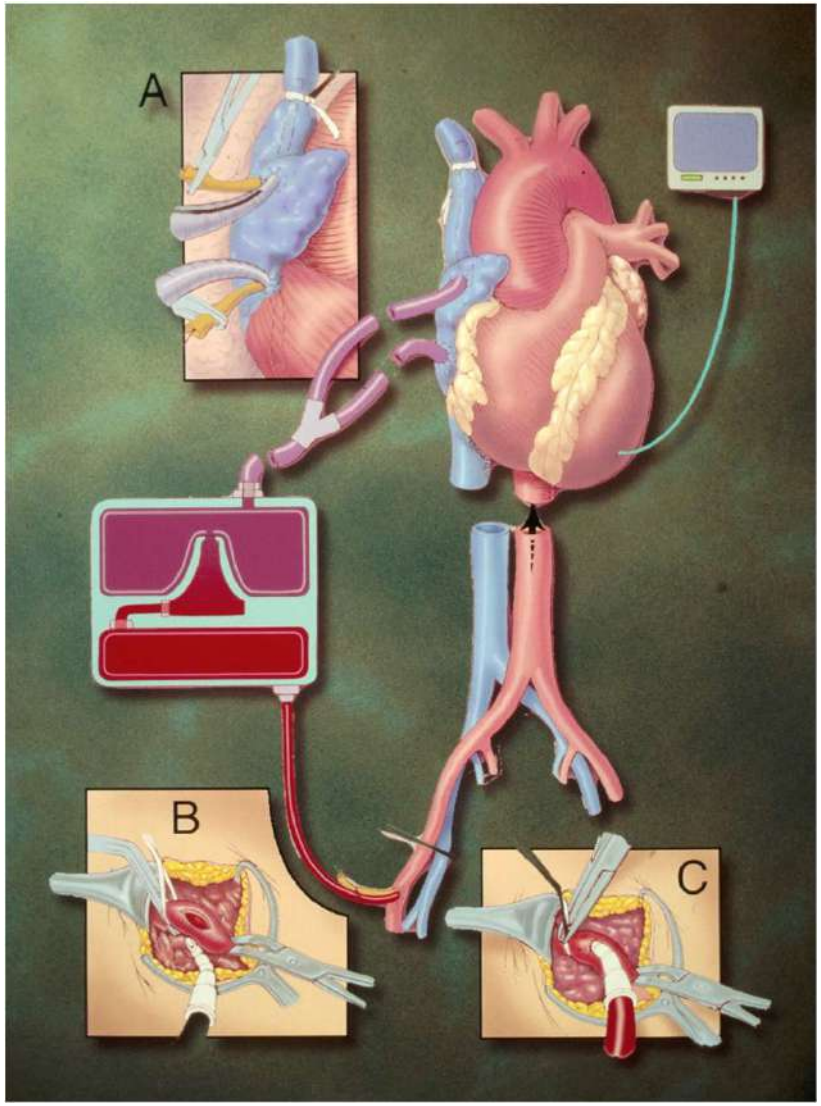
To avoid or correct erectile dysfunction:

- Perfusion of 1 or both internal iliac arteries
- Dissection must spare IMA and neural fibers on left side of iliac artery




Cross-section
venous drainage
Corpus
cavernosum
Deep
dorsal
vein
FLACCID
10-15 mmHg
Erect
80-90 mmHg


Occlusion
Internal iliac artery
Internal pudendal artery
Dorsal arteries of penis
End-to-end aortic anastomosis
End-to-side bypass


A
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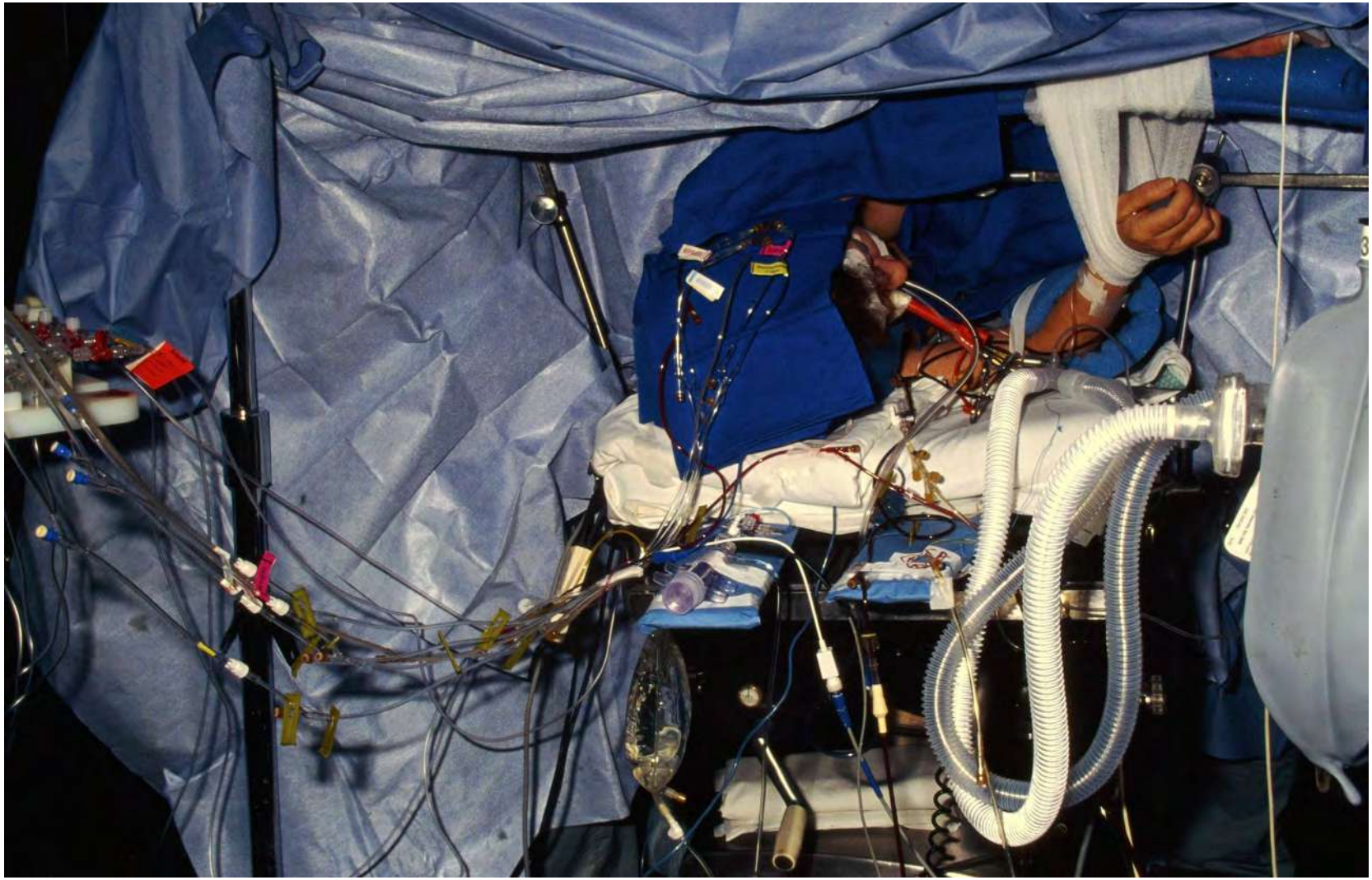
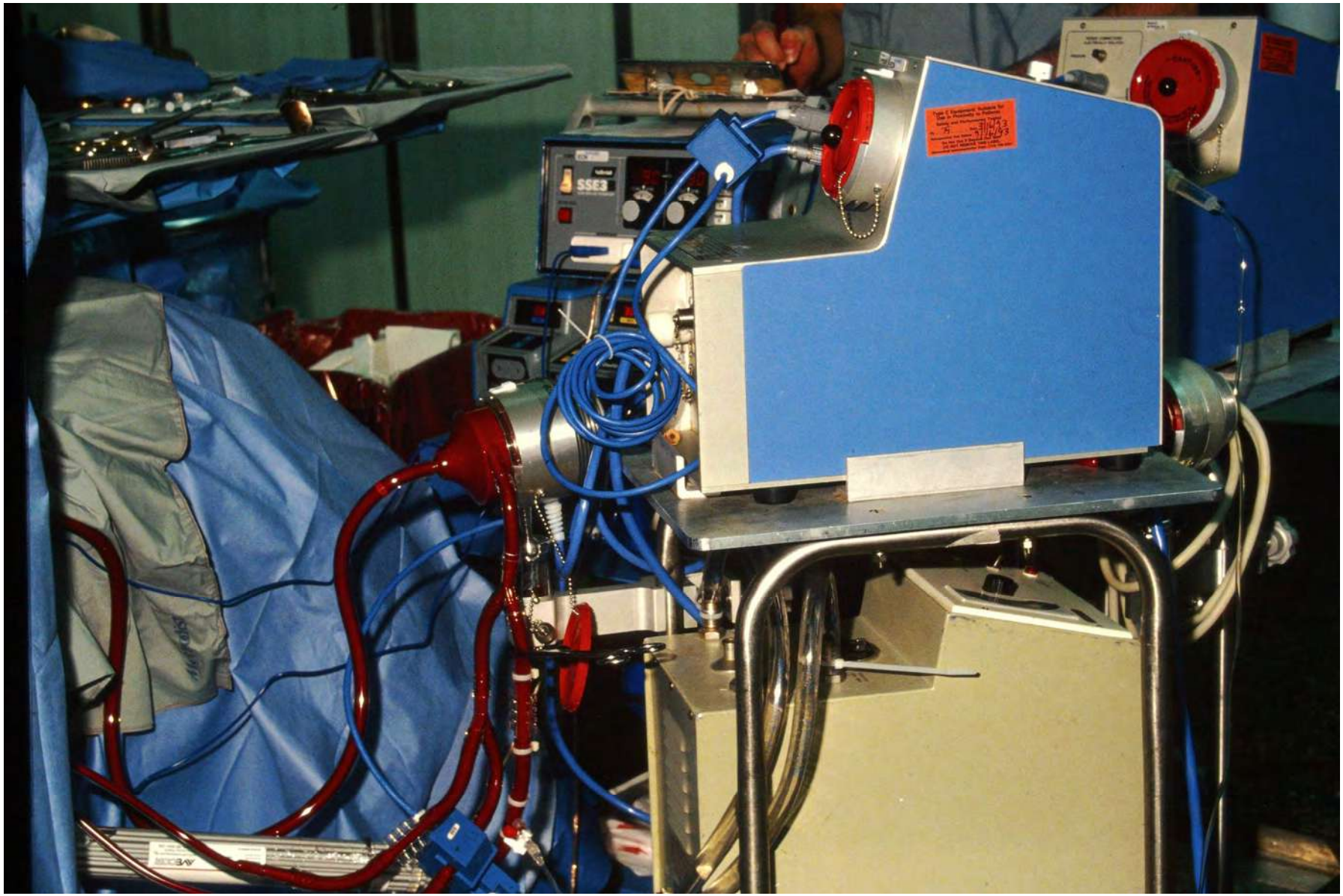
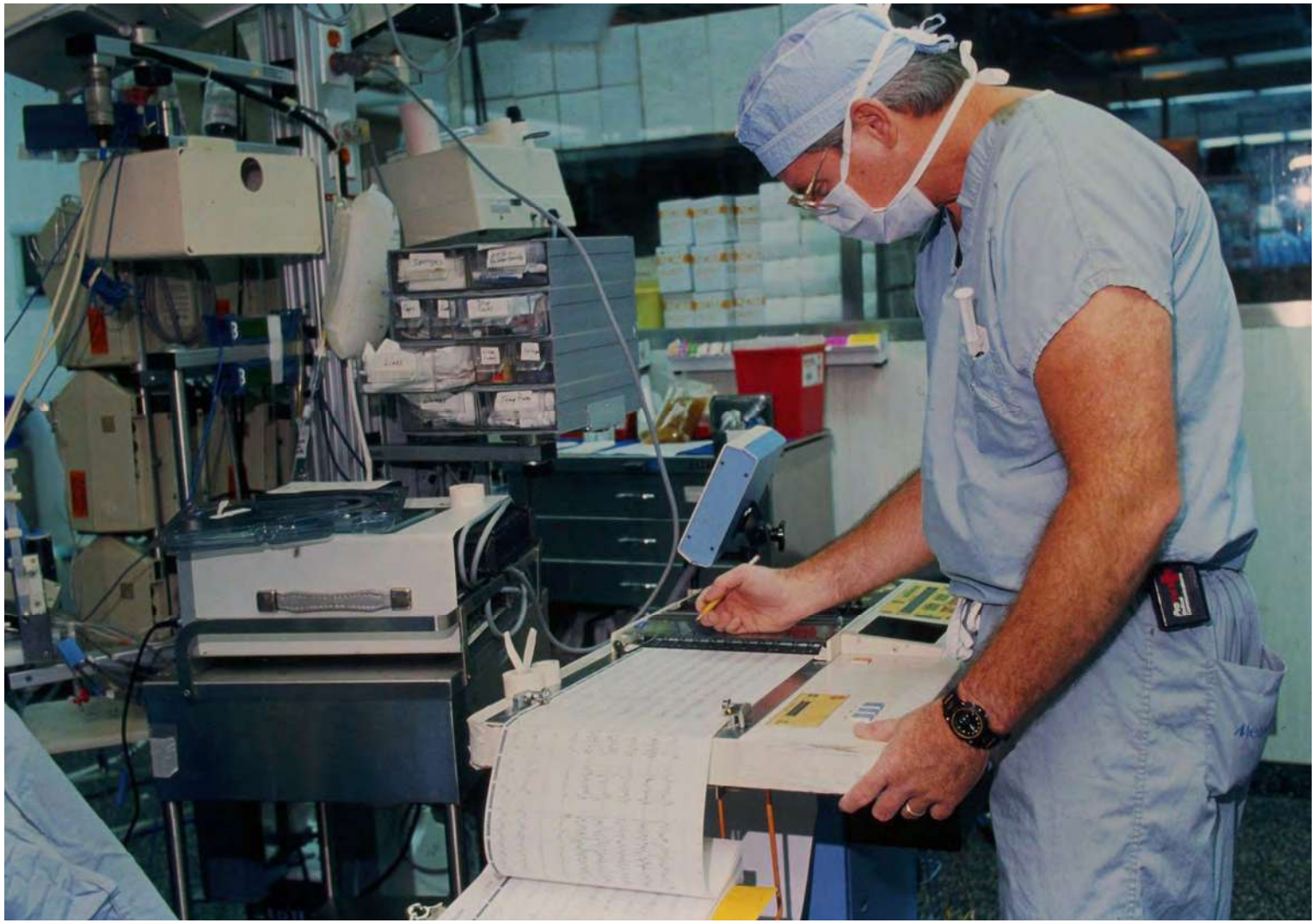
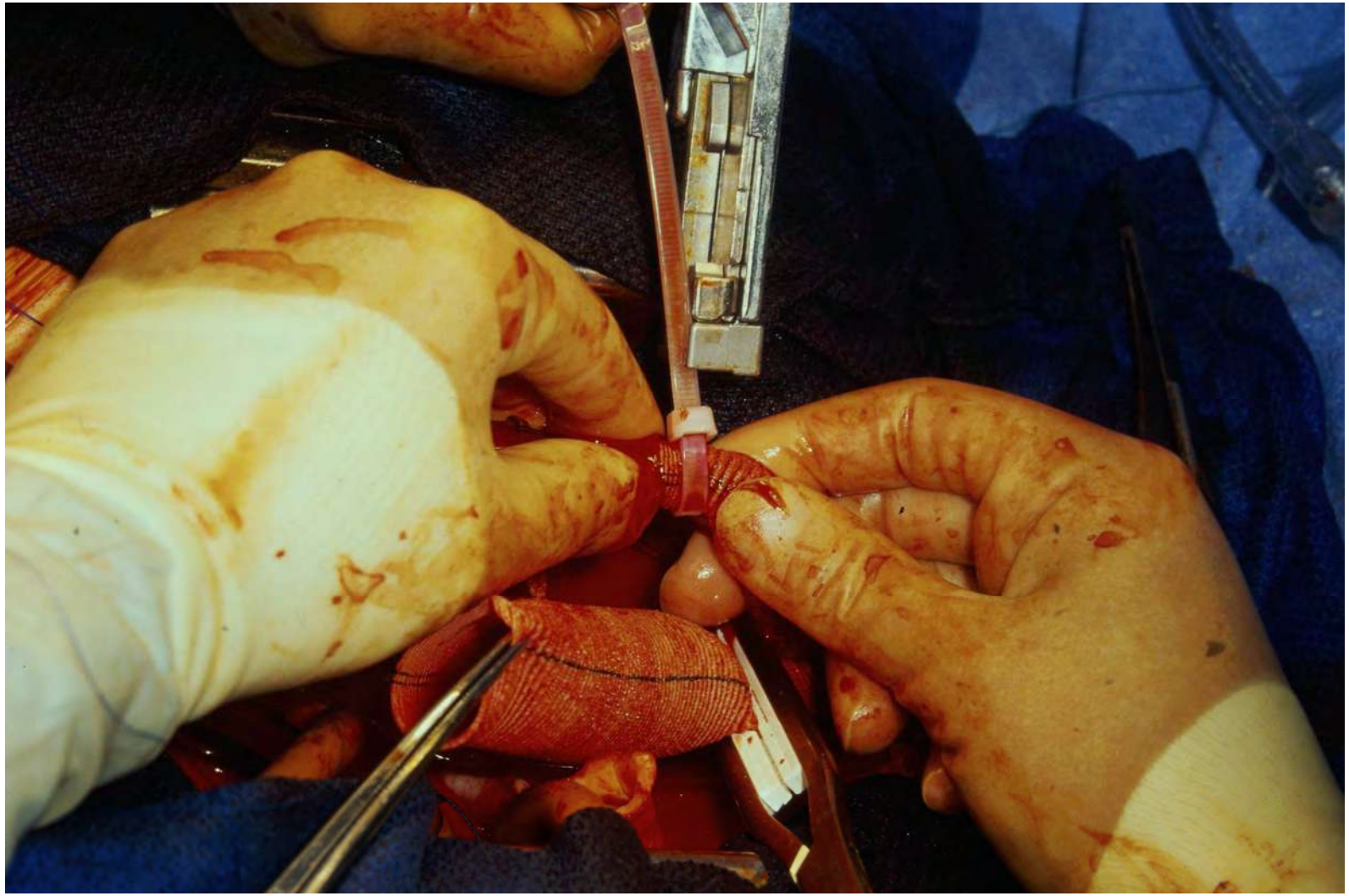
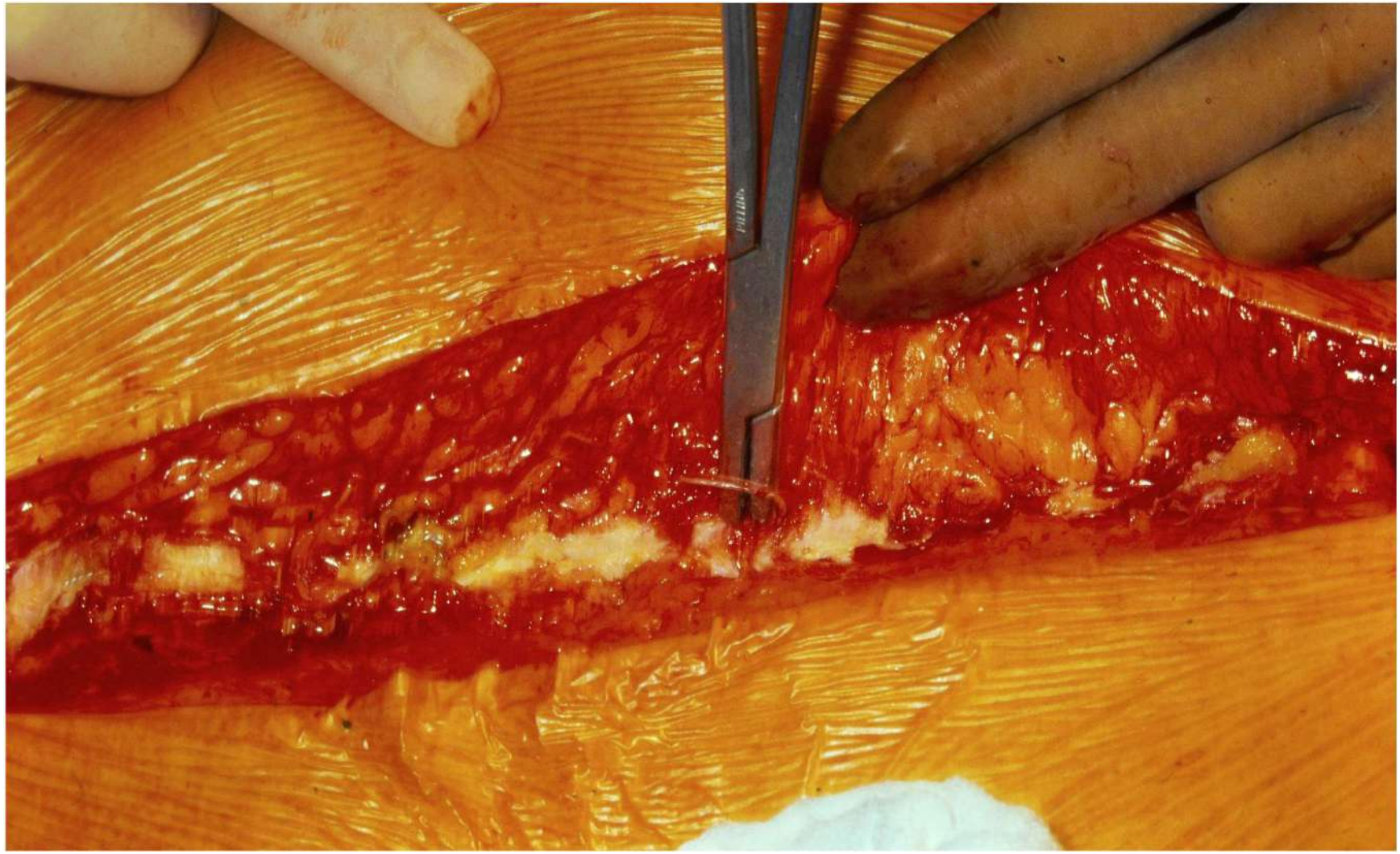
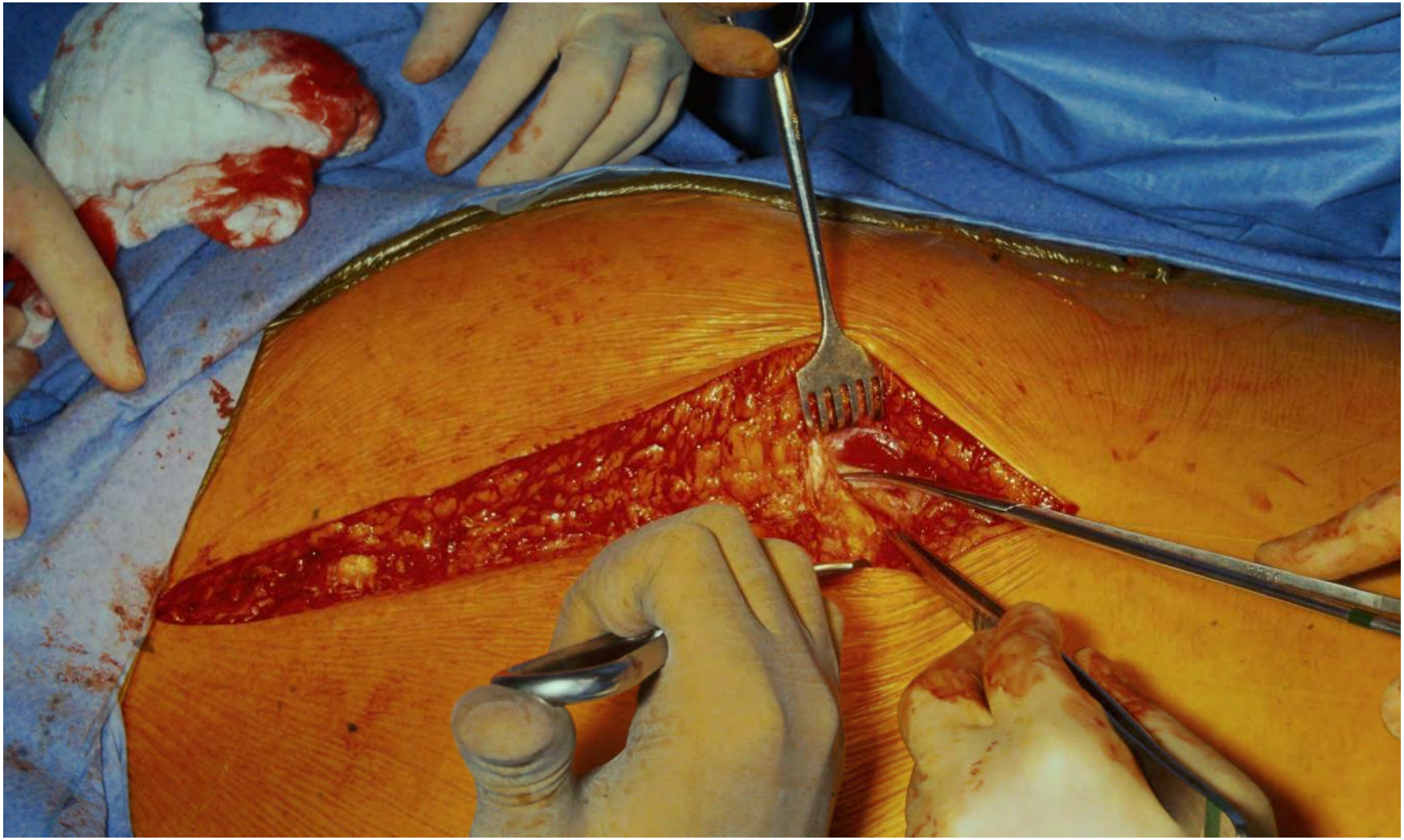


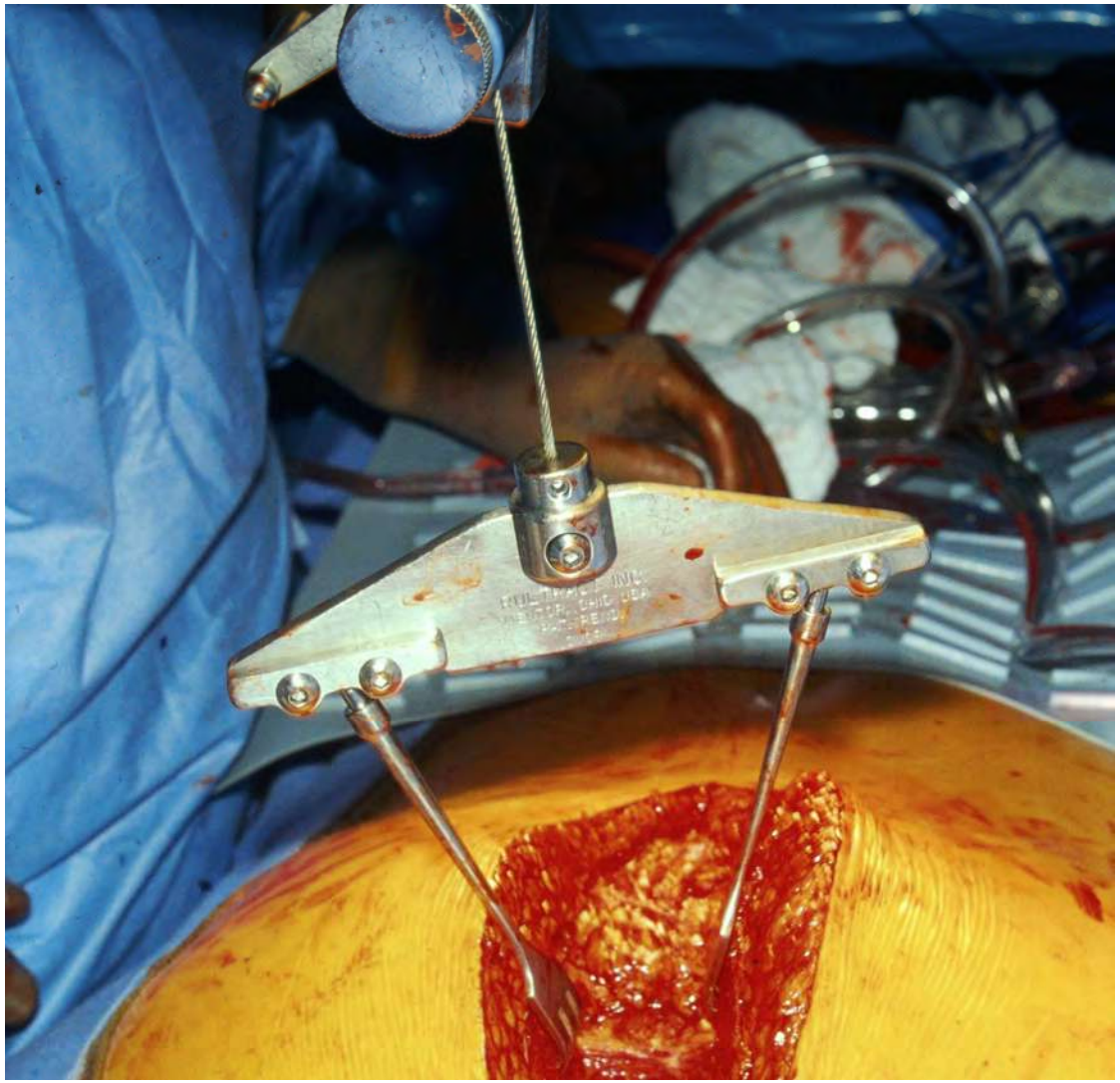

SSE3

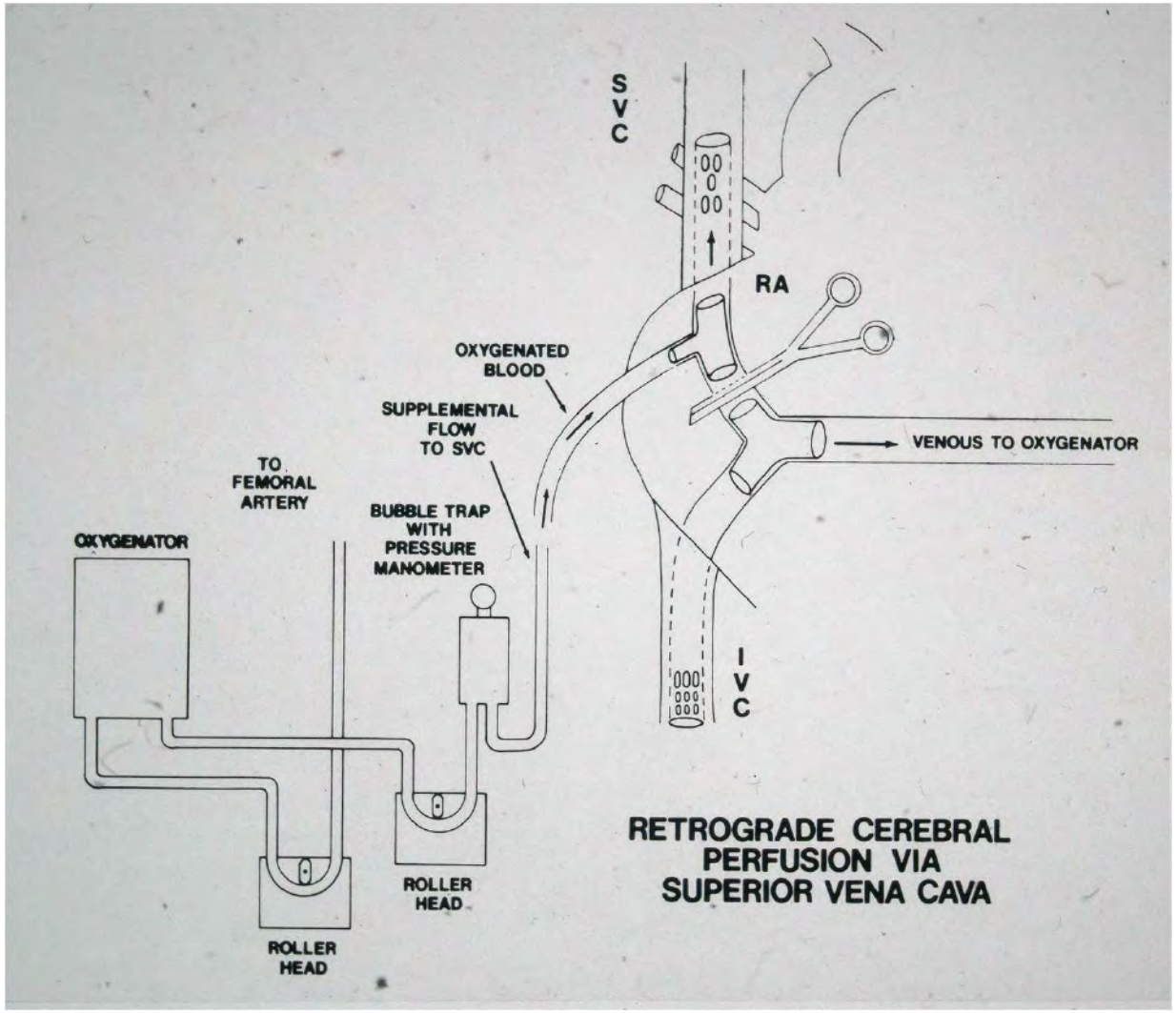


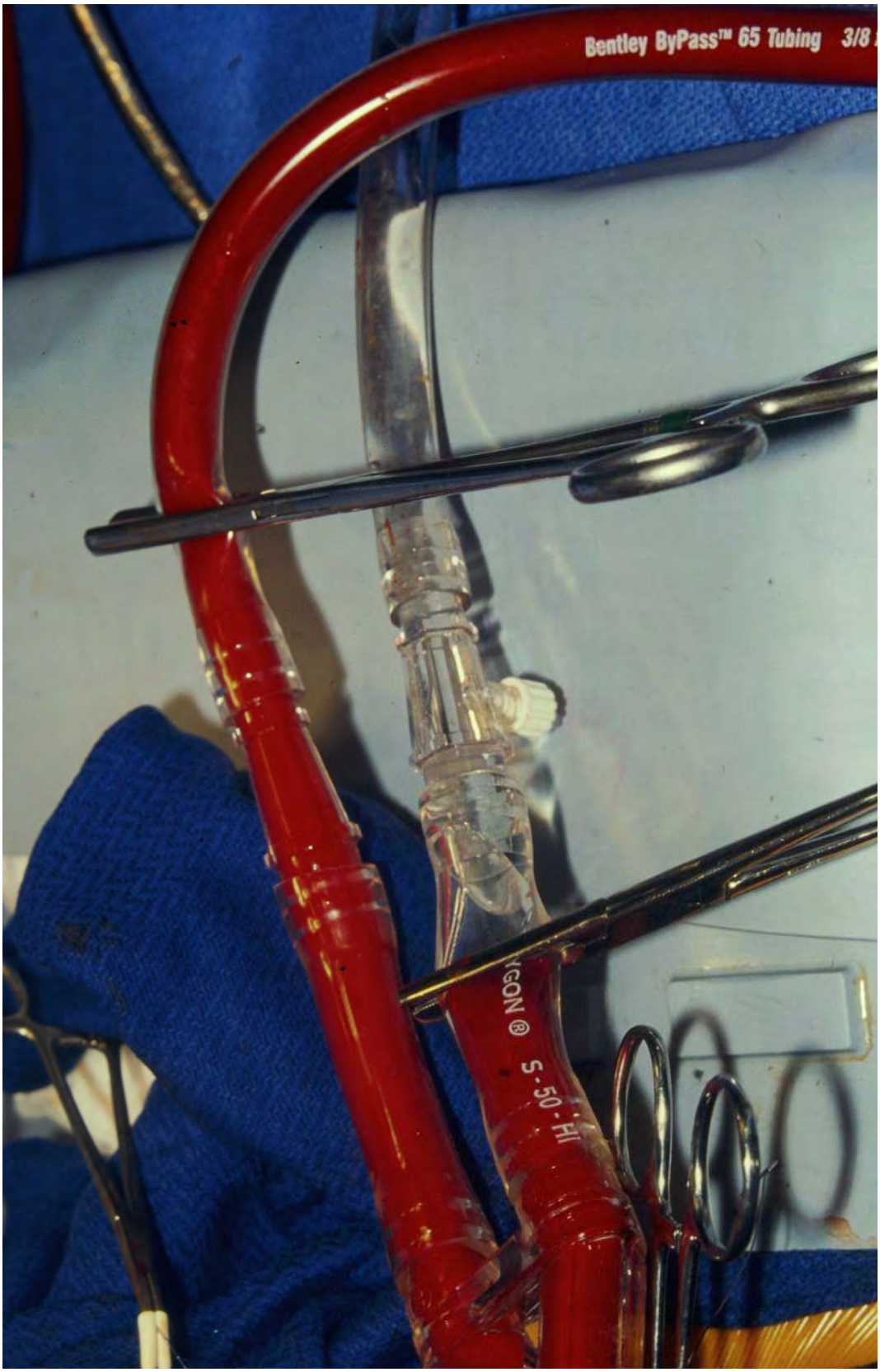


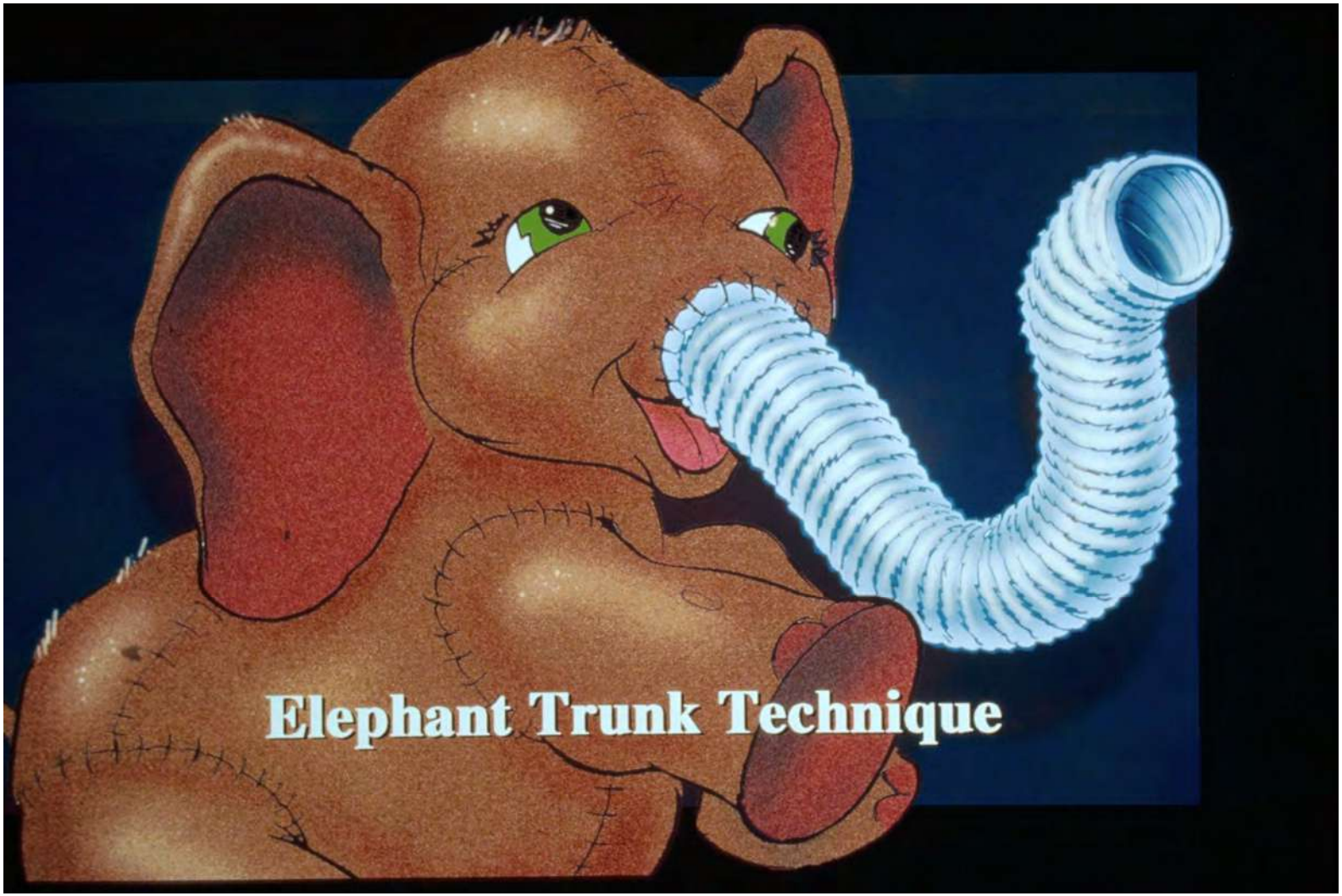


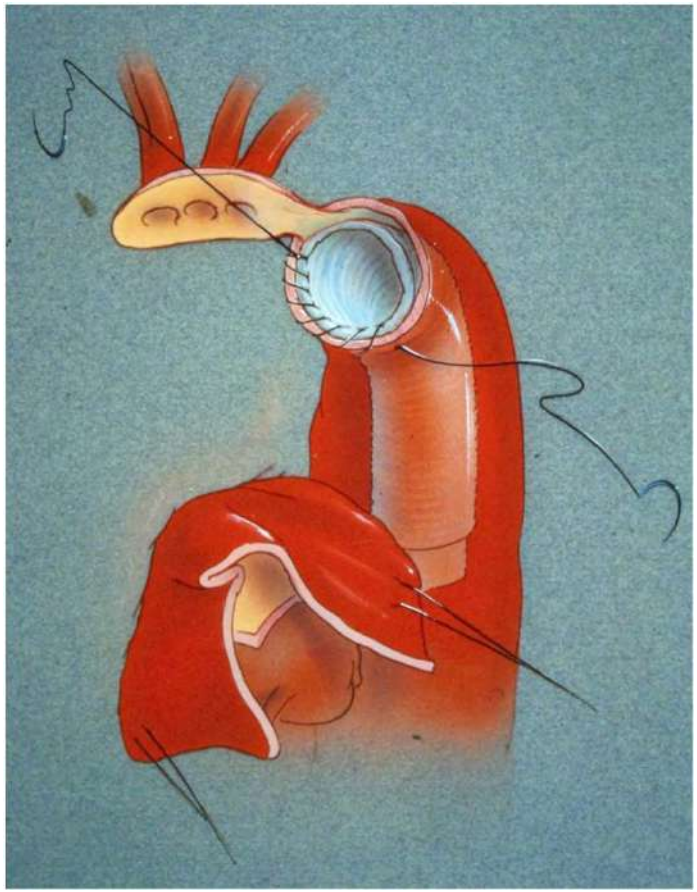


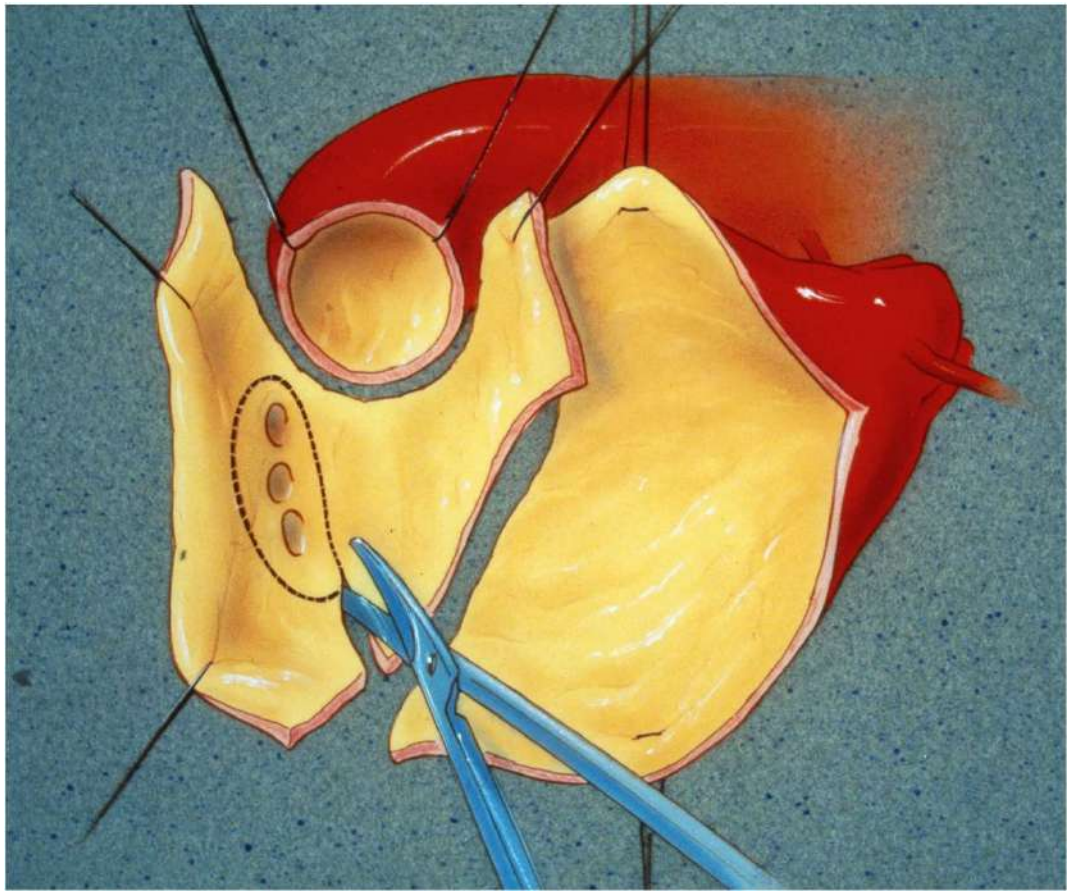


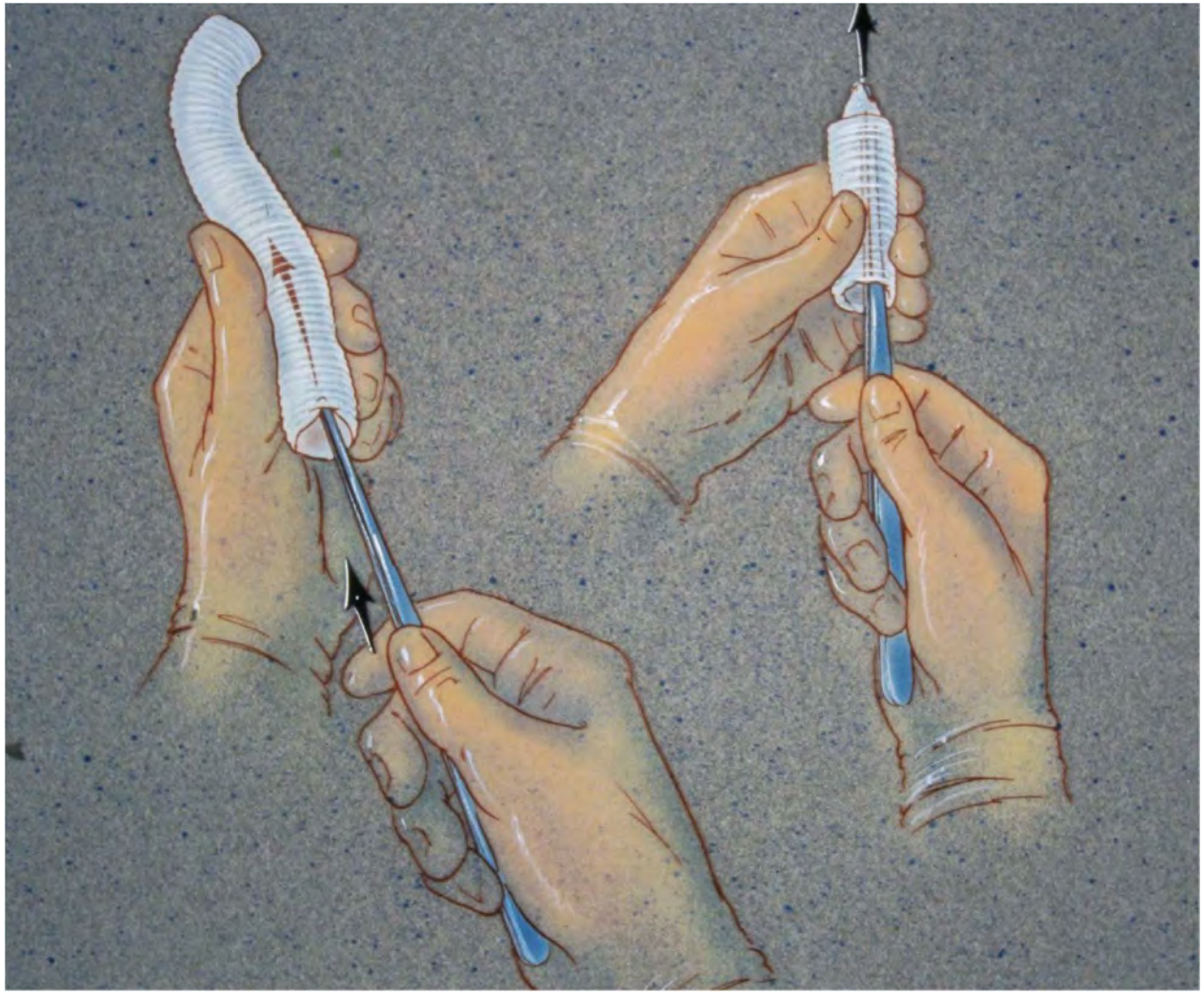

SVC
RA
OXYGENATED BLOOD
SUPPLEMENTAL FLOW TO SVC
VENOUS TO OXYGENATOR
TO FEMORAL ARTERY
BUBBLE TRAP WITH PRESSURE MANOMETER
OXYGENATOR
IVC
ROLLER HEAD
ROLLER HEAD
RETROGRADE CEREBRAL PERFUSION VIA SUPERIOR VENA CAVA

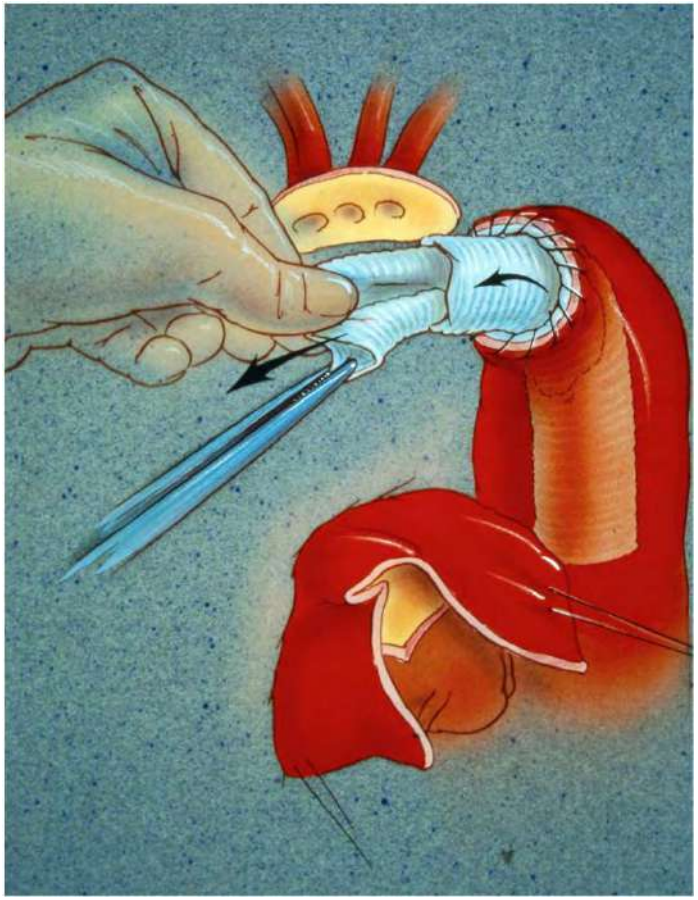

Bentley ByPass™ 65 Tubing 3/8
IGON ® S-50-HI

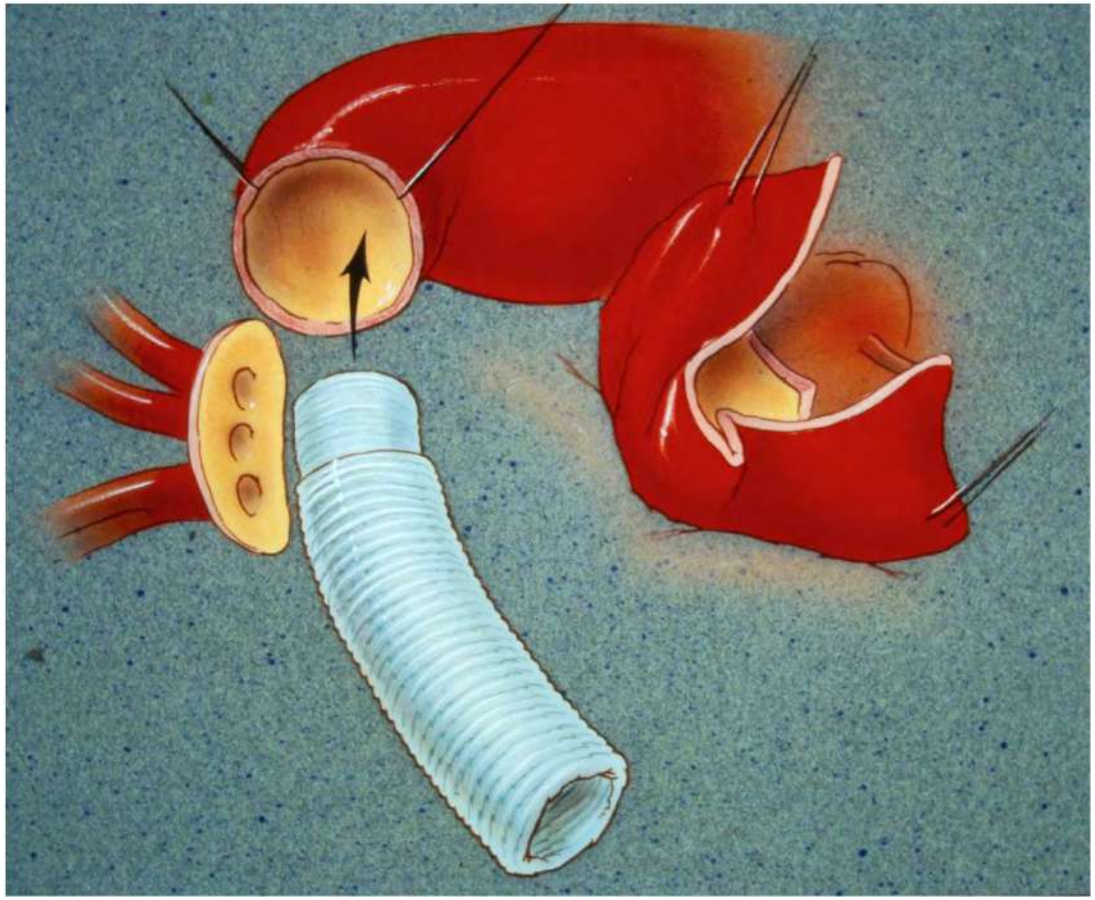

Elephant Trunk Technique

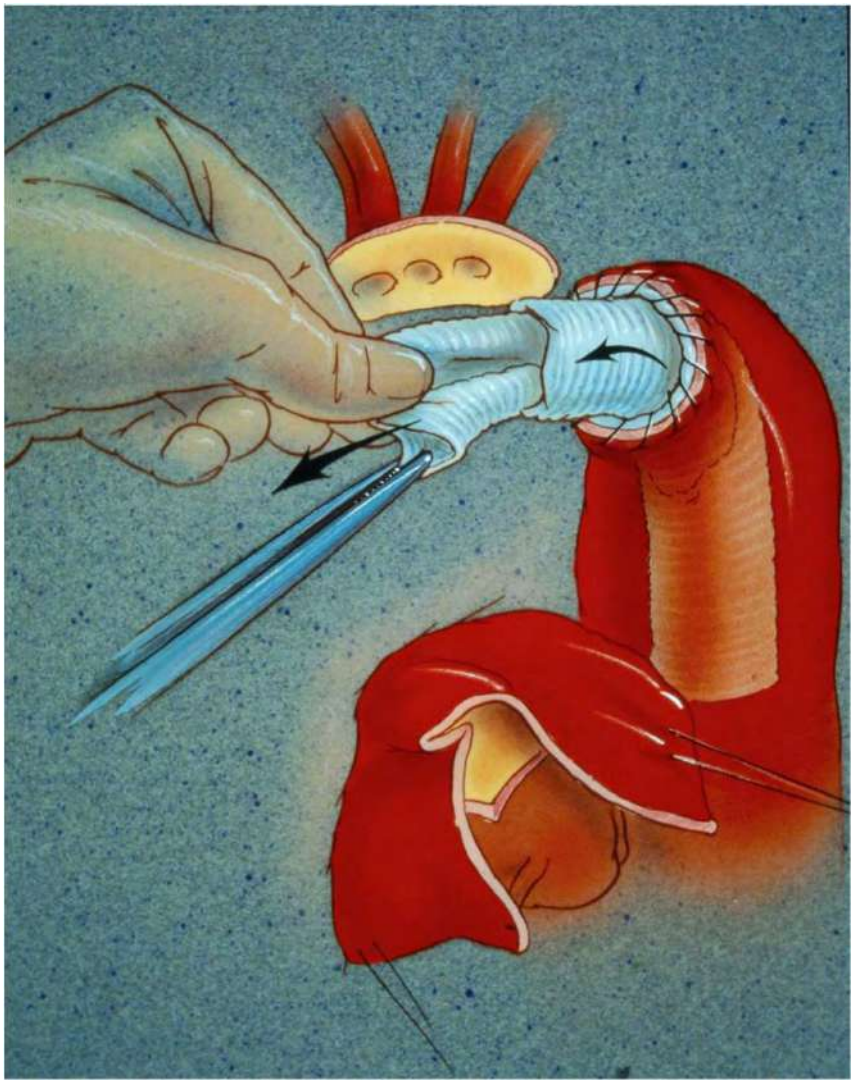


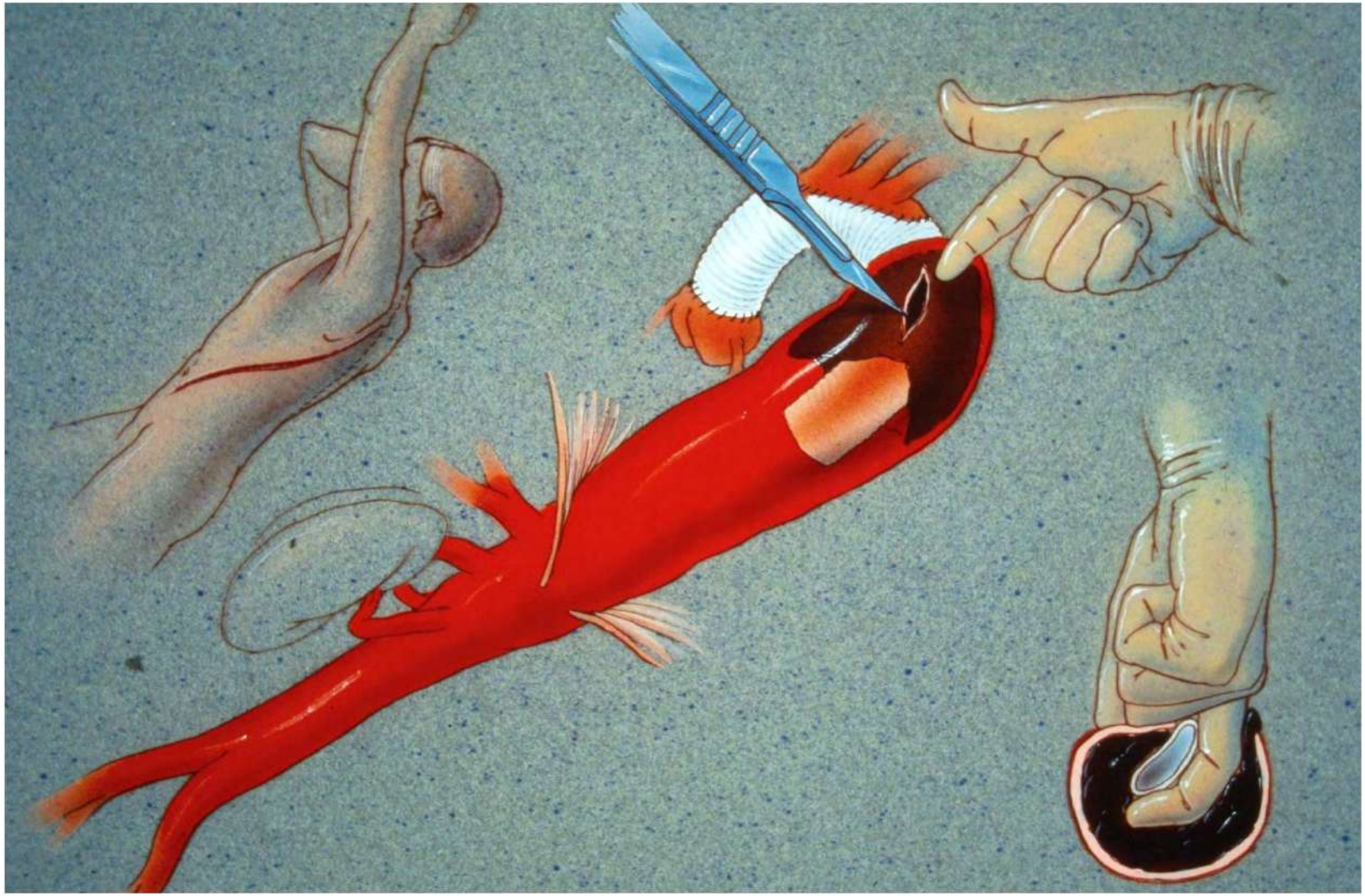


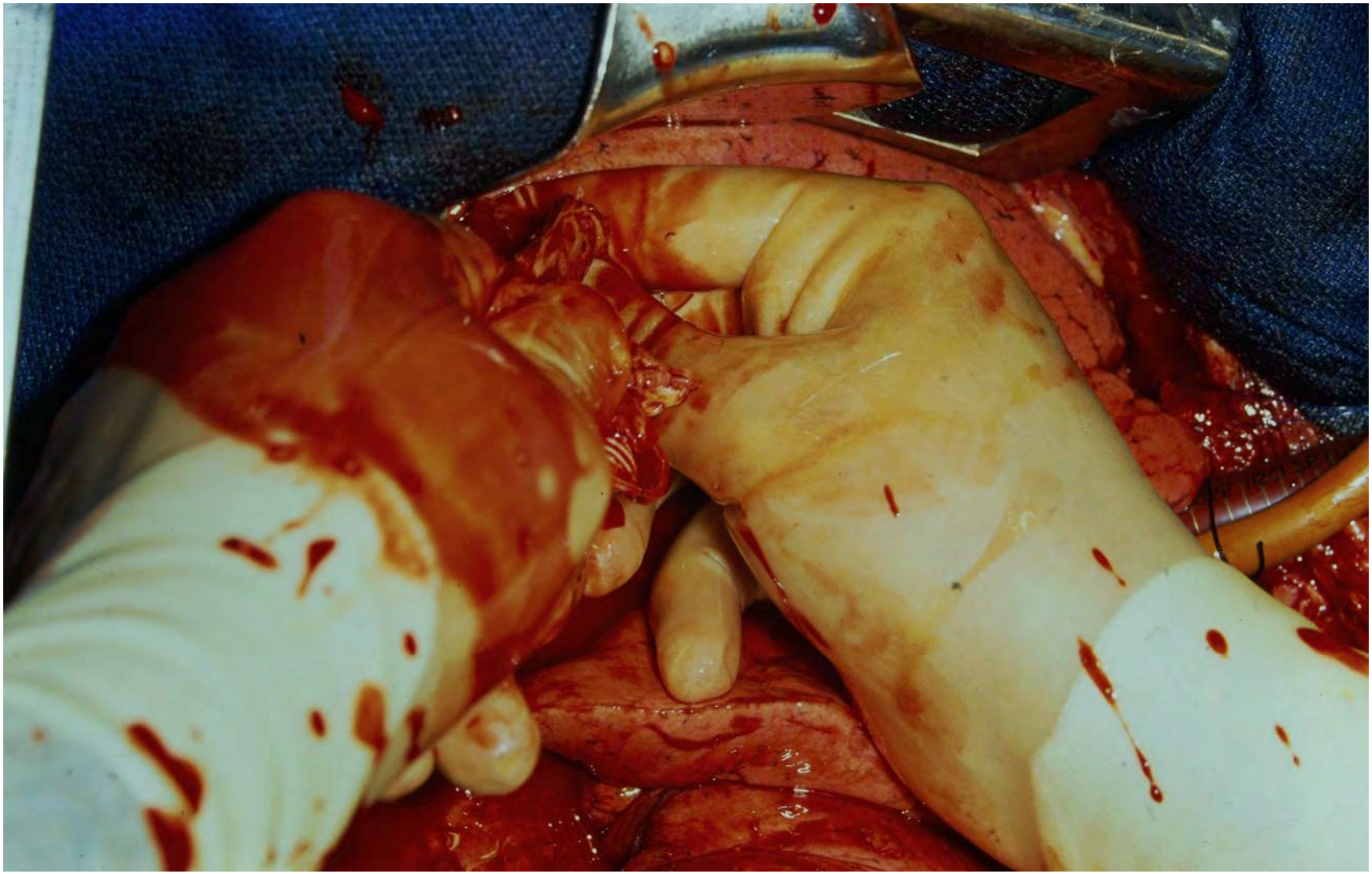


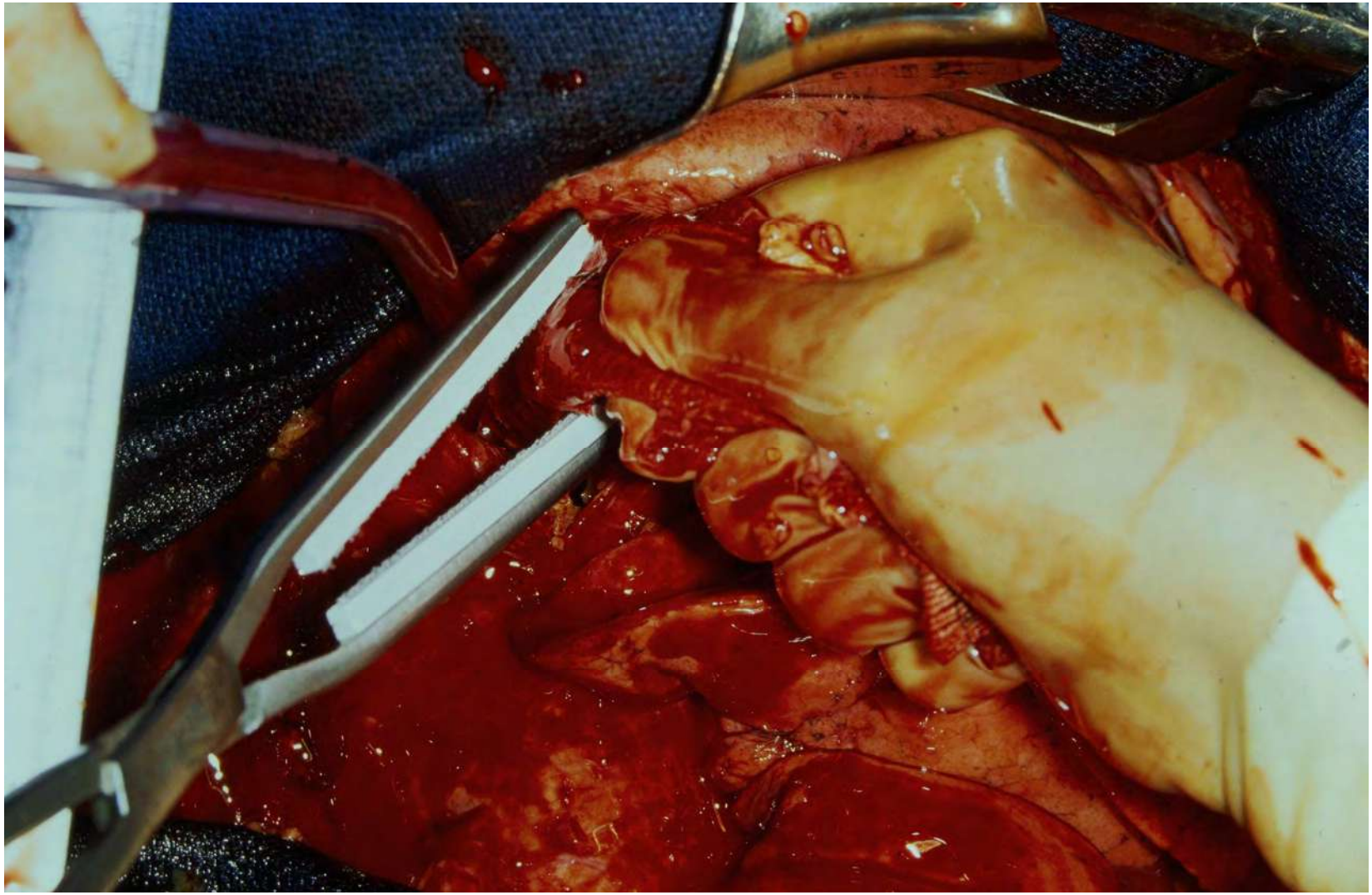


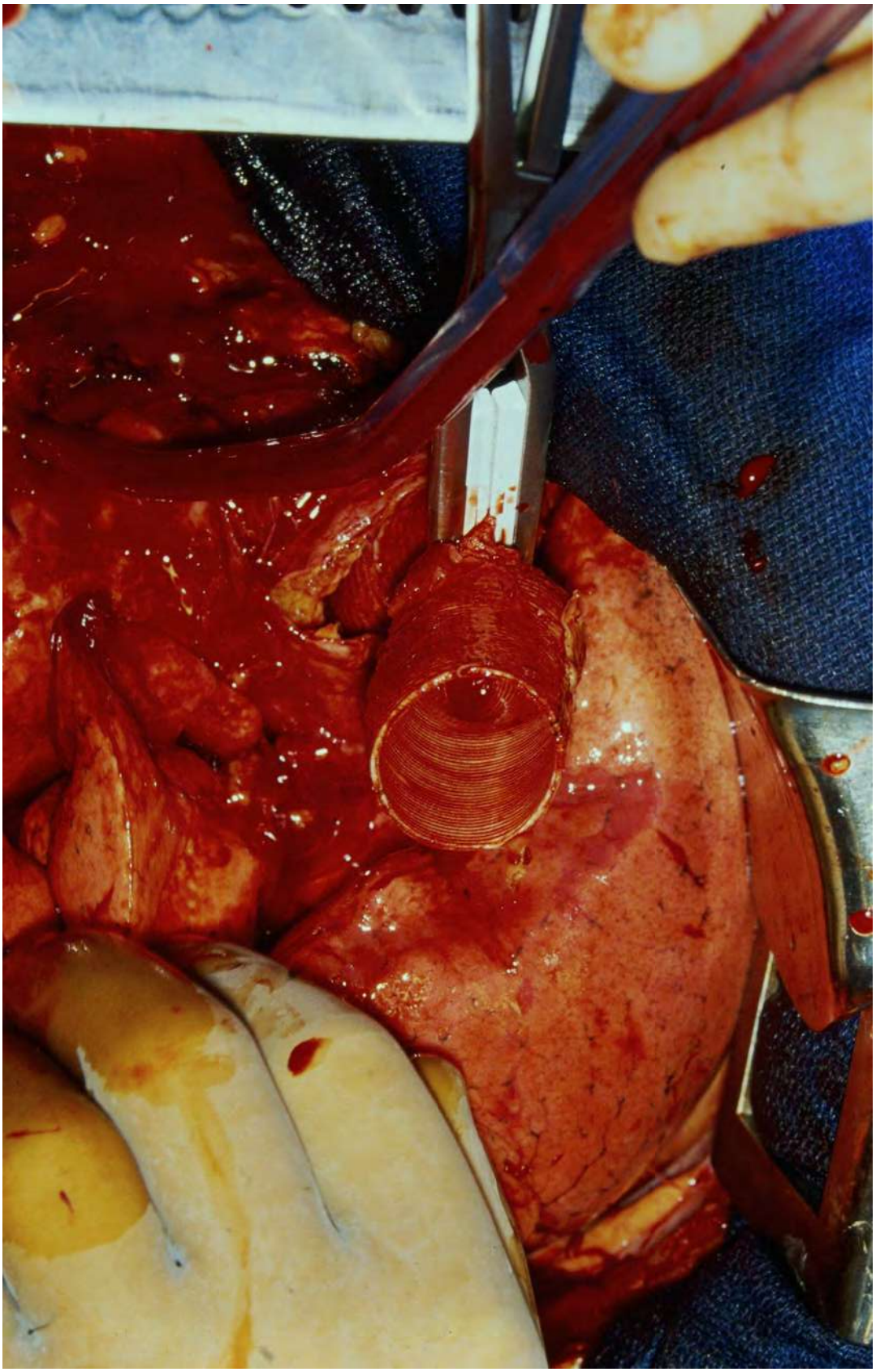


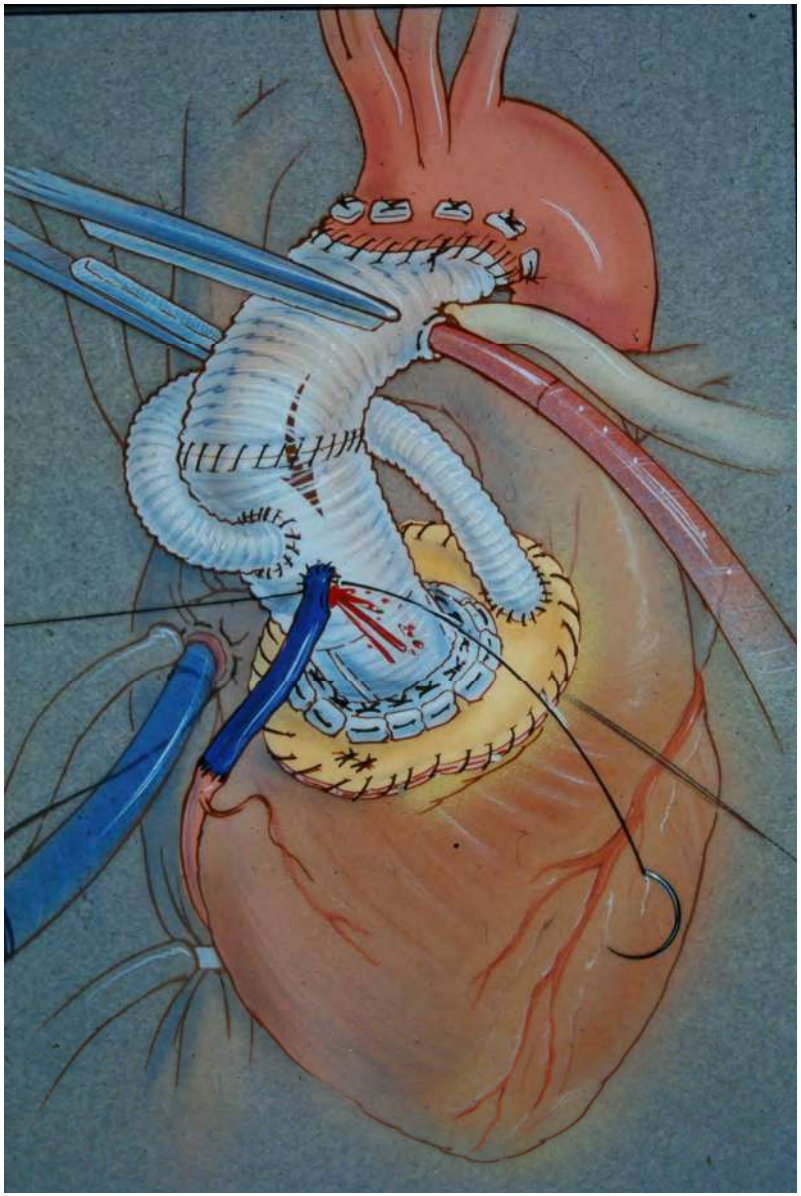


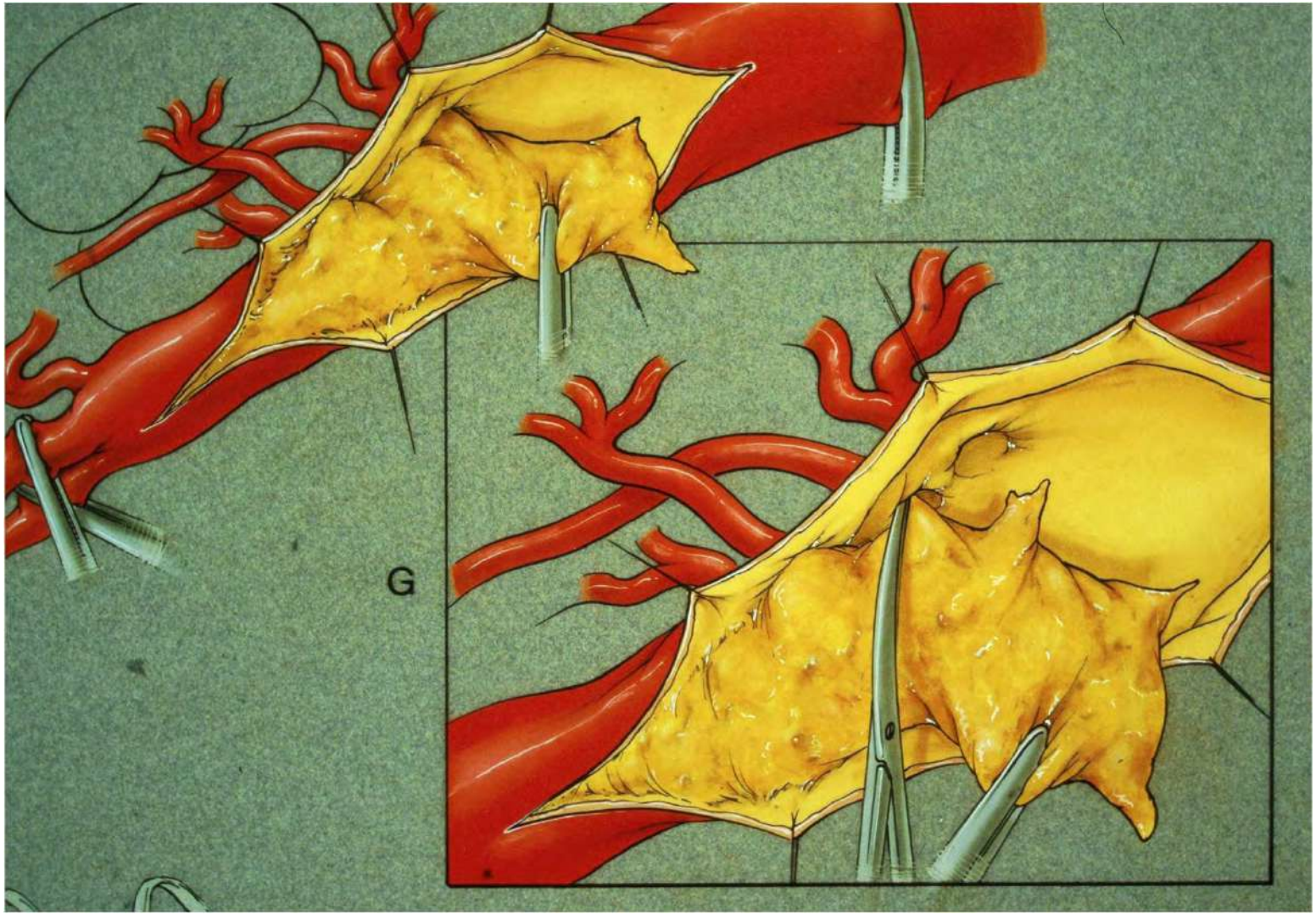








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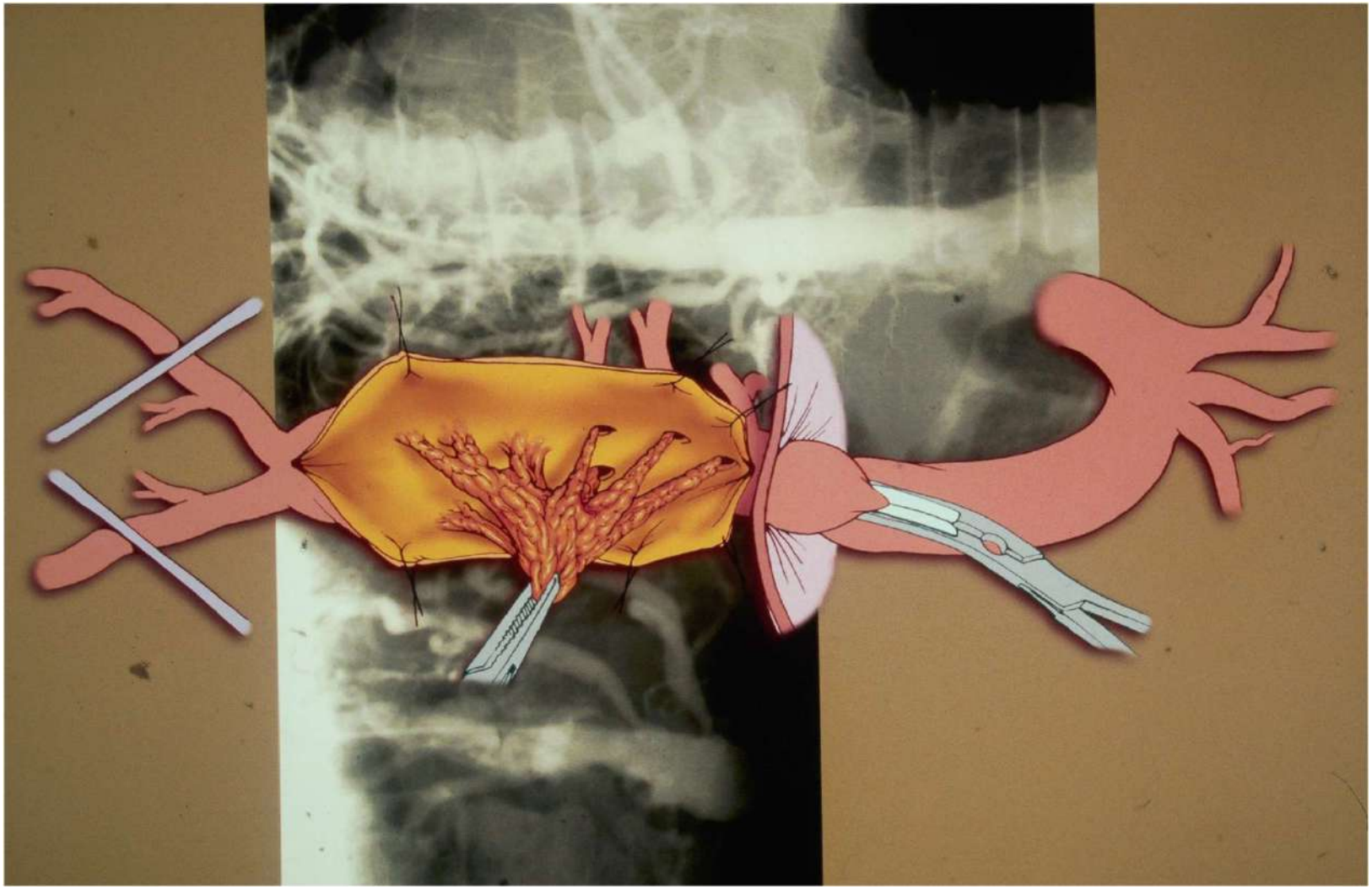
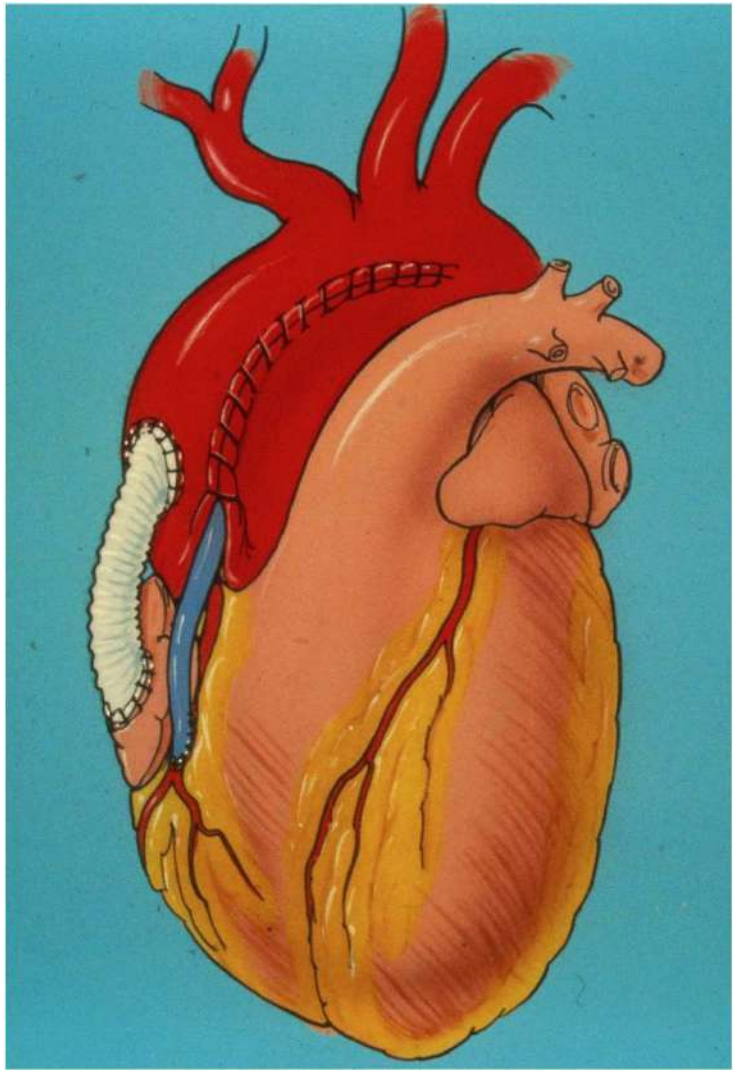
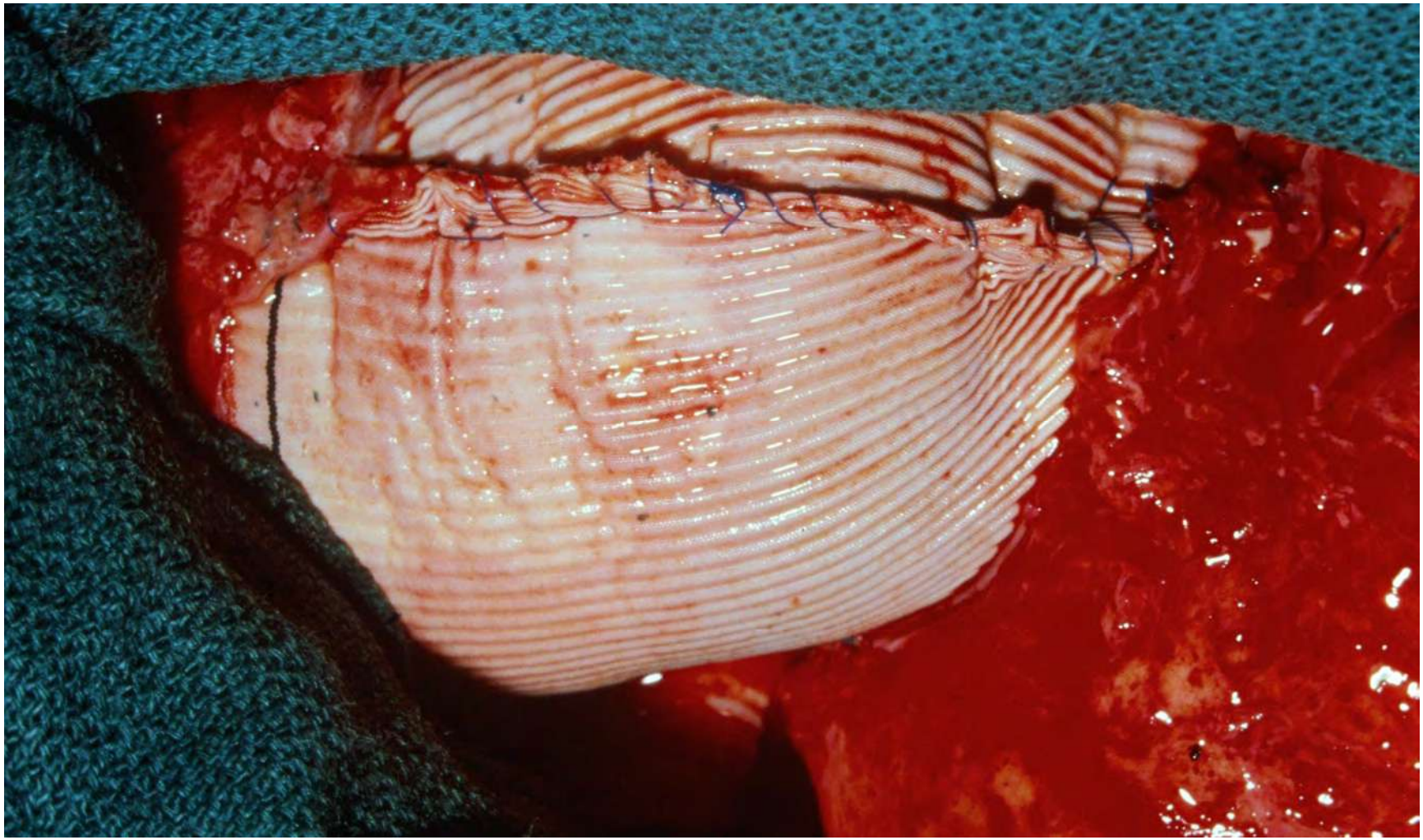
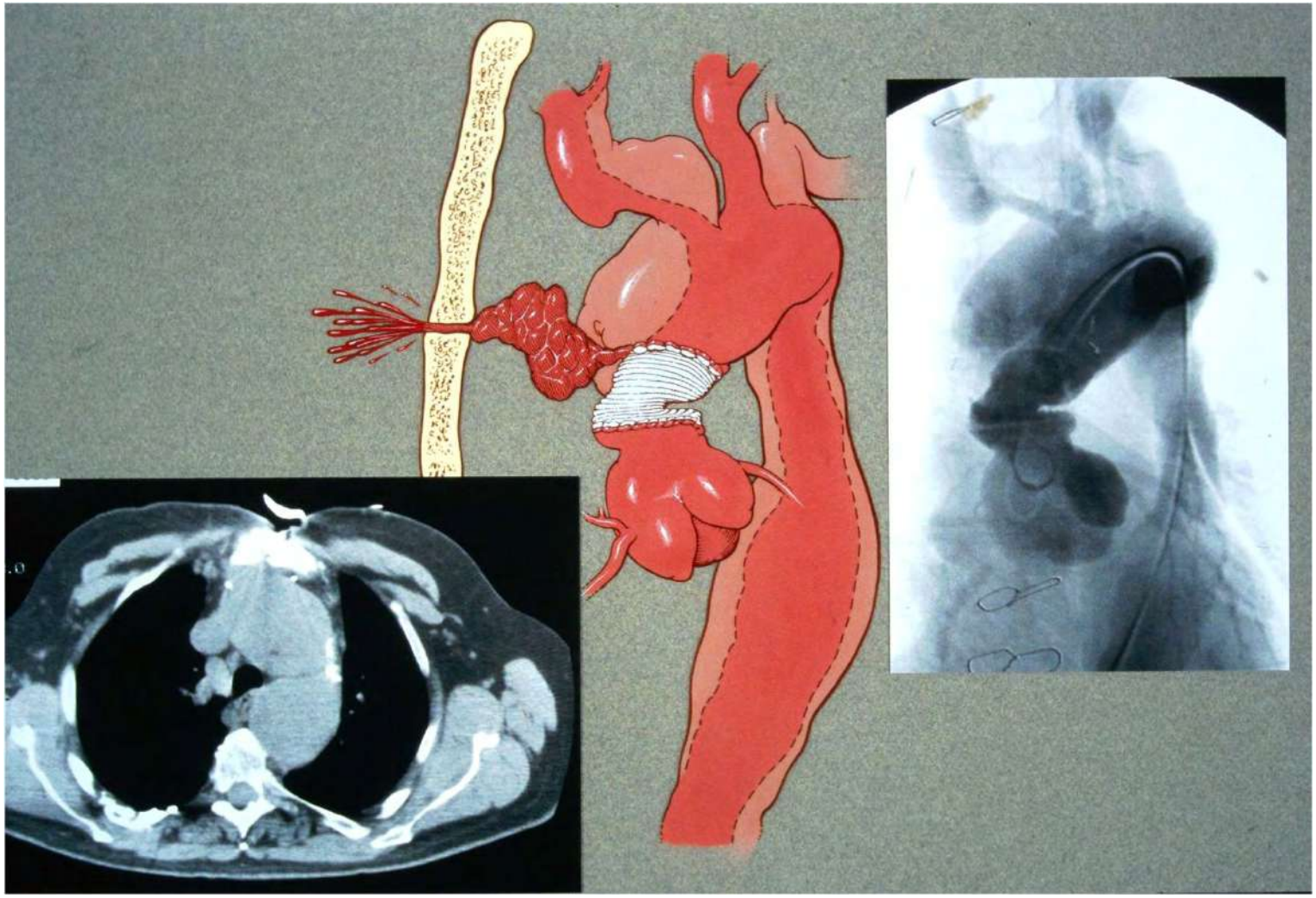
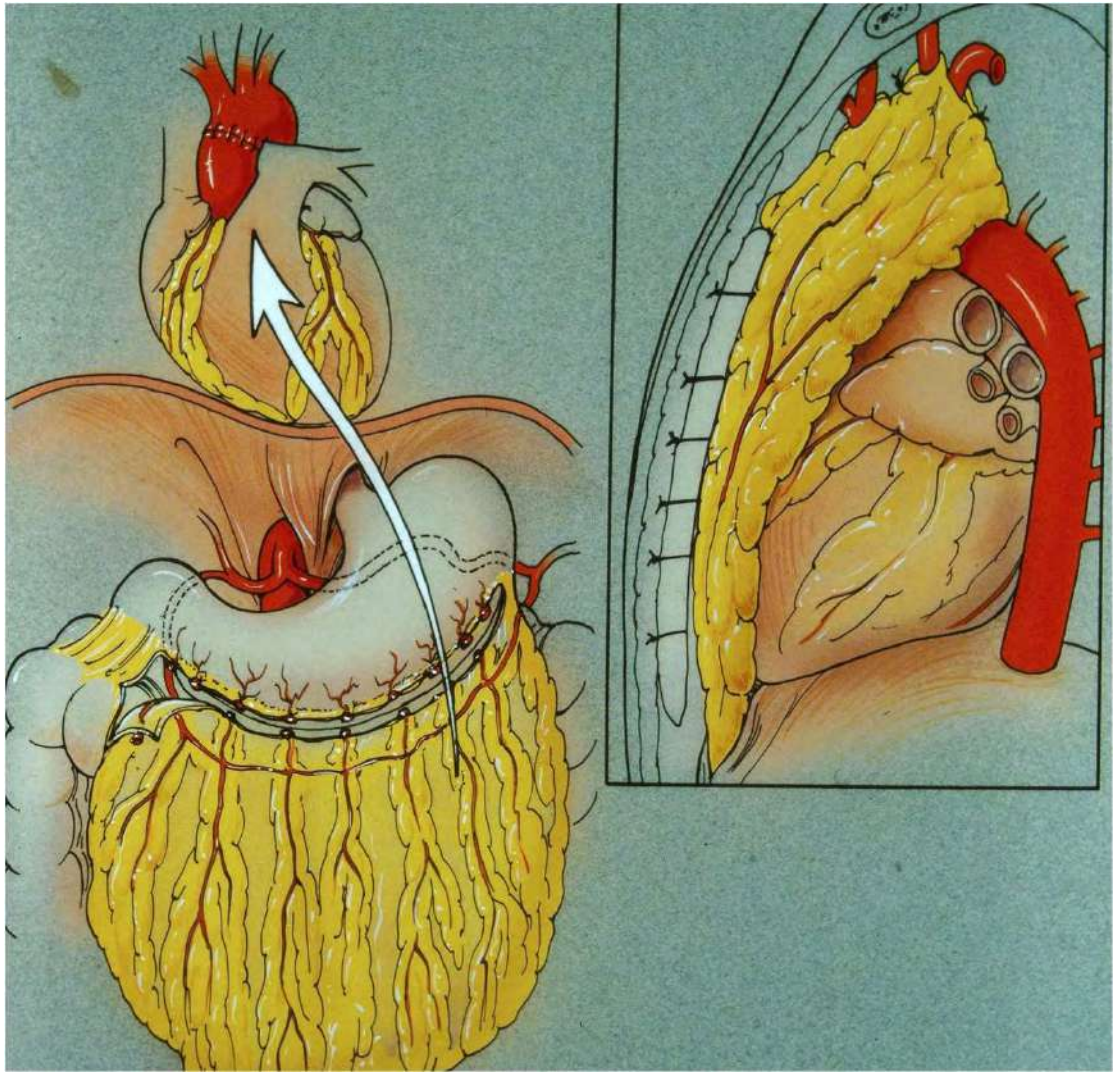
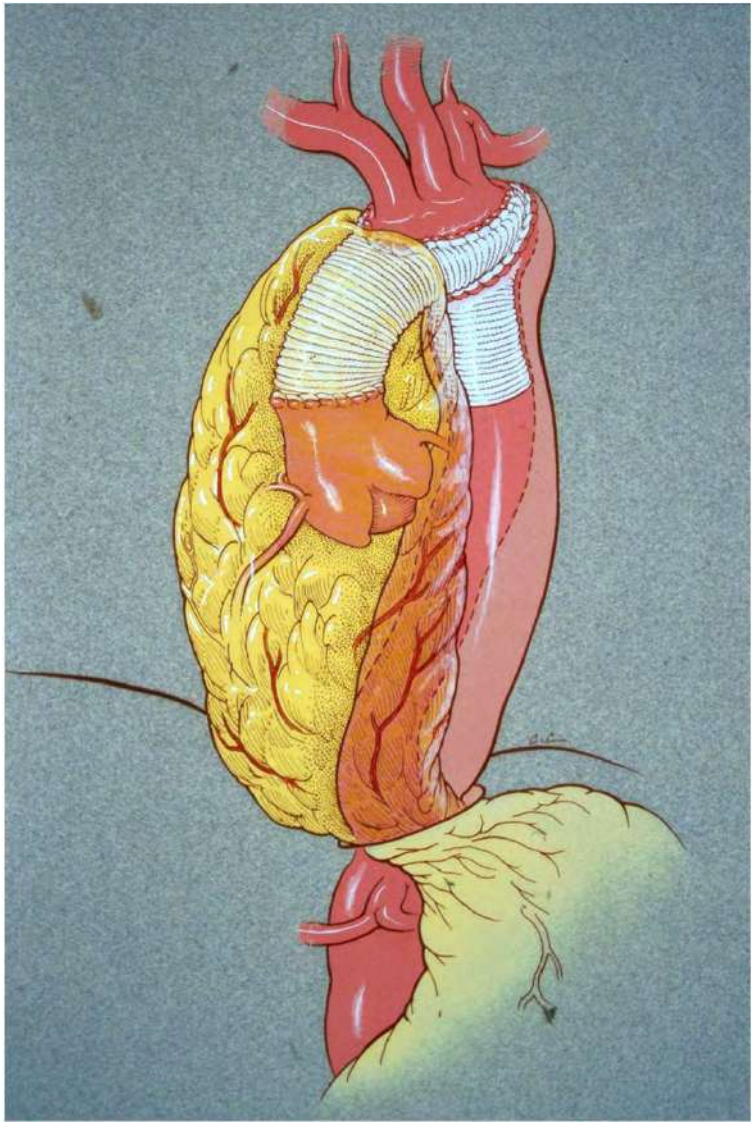




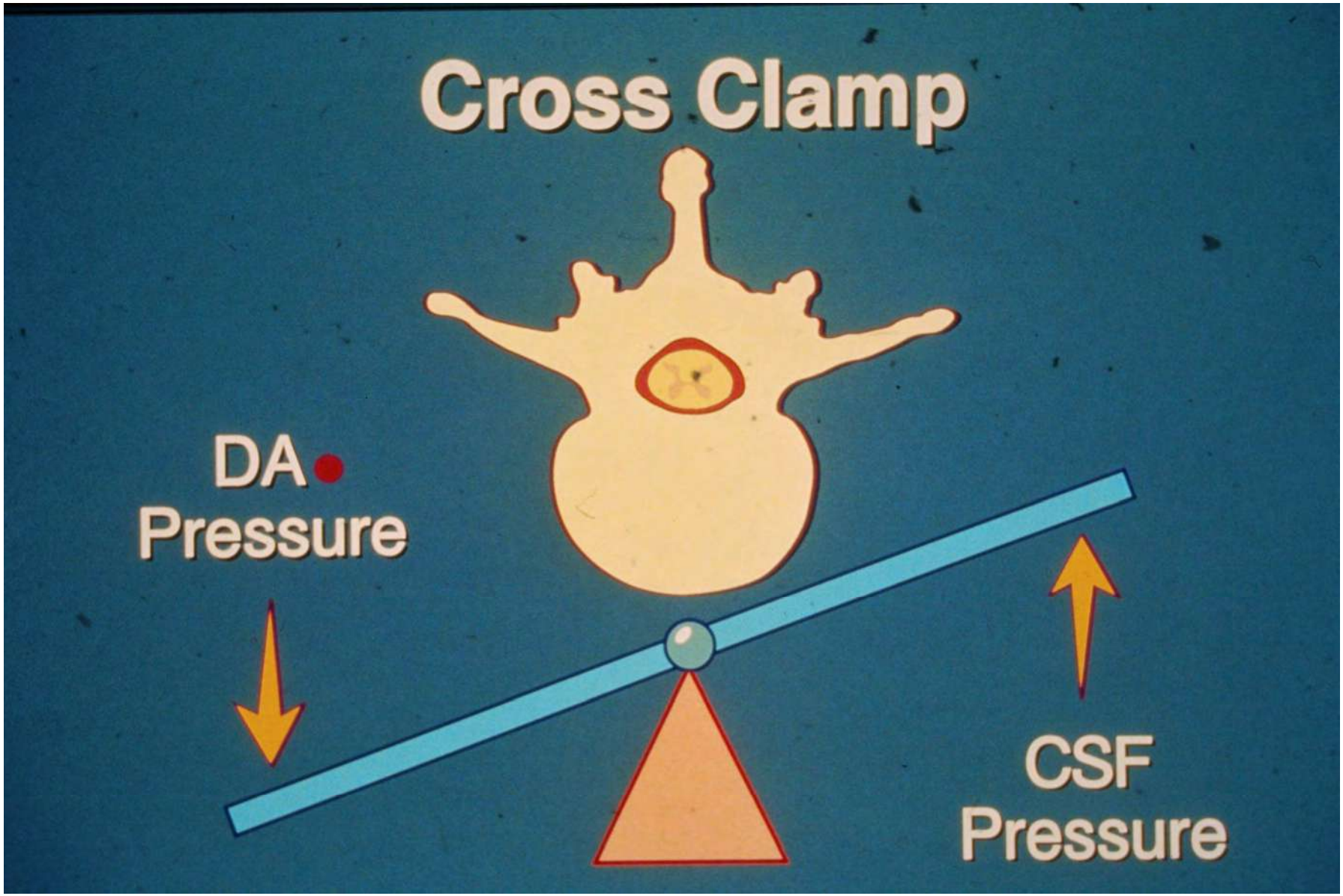








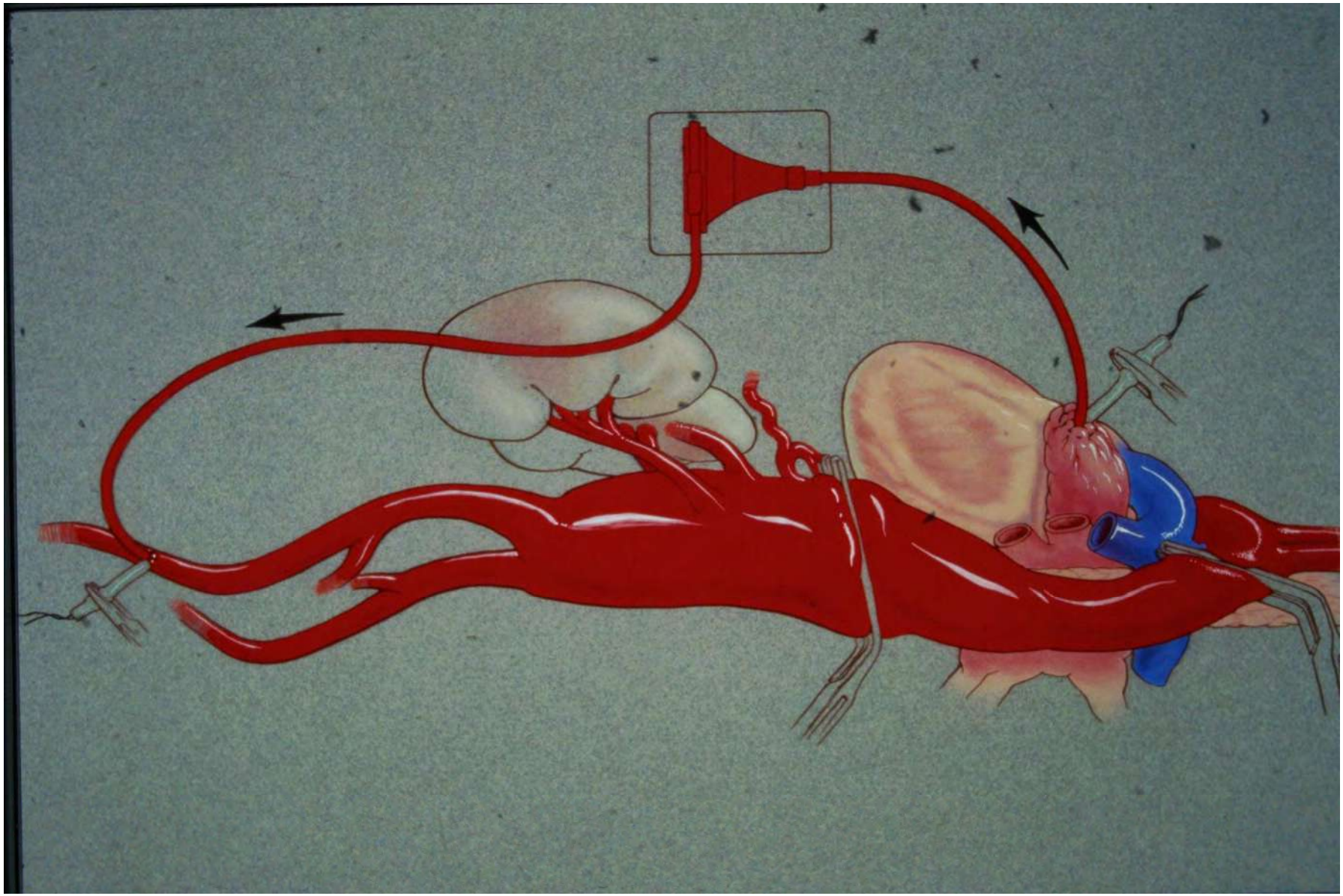
Matas	1903	Endoaneurysmorrhaphy
Carrel	1906	Direct Vessel Attachment to Central Artery
Dubost	1951	Abdominal Aortic Aneurysm
Ellis	1954	AAA with Renal Artery
Etheredge	1954	Large Upper Abdominal Aortic Aneurysm
DeBakey	1955	Thoraco-Abdominal Aortic Aneurysm Temporary Shunt Dacron Graft
Spencer	1958	Reattachment of Intercostal Arteries in Dogs

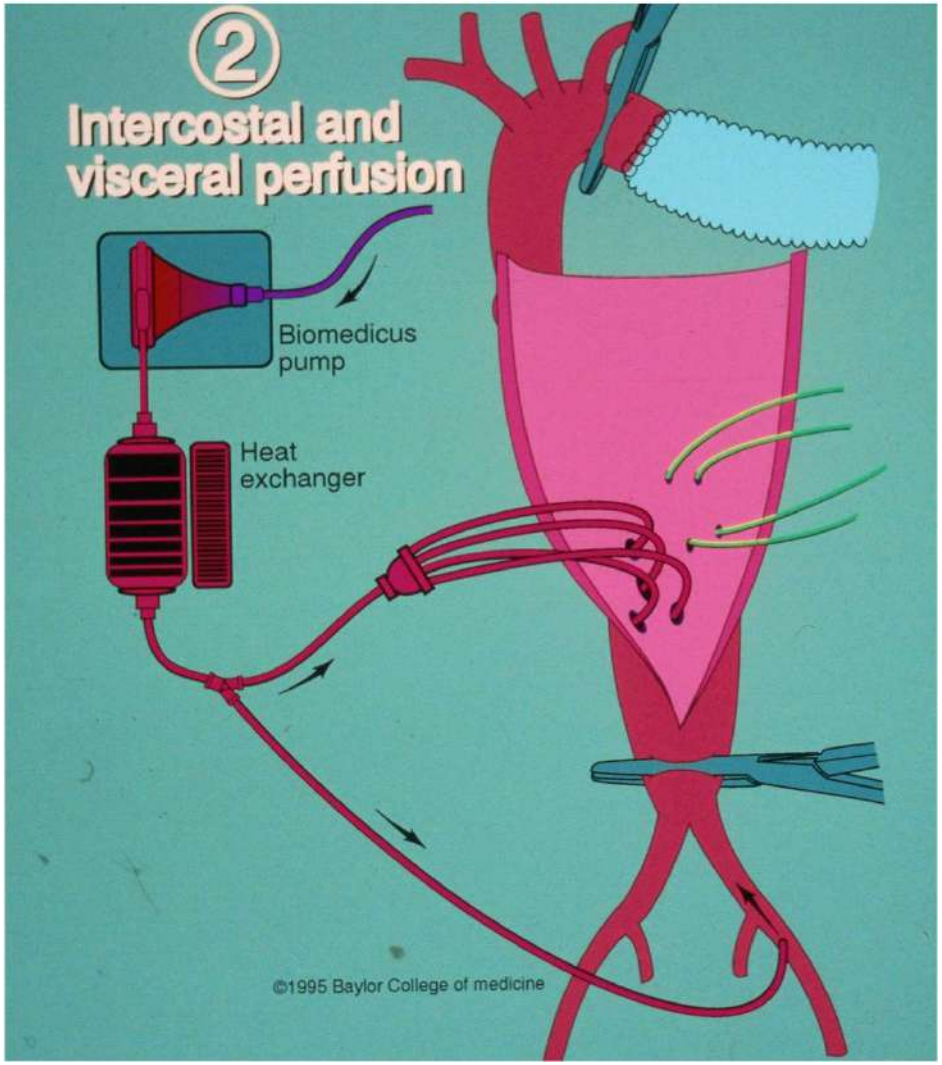

Cross Clamp
DA
Pressure
CSF
Pressure

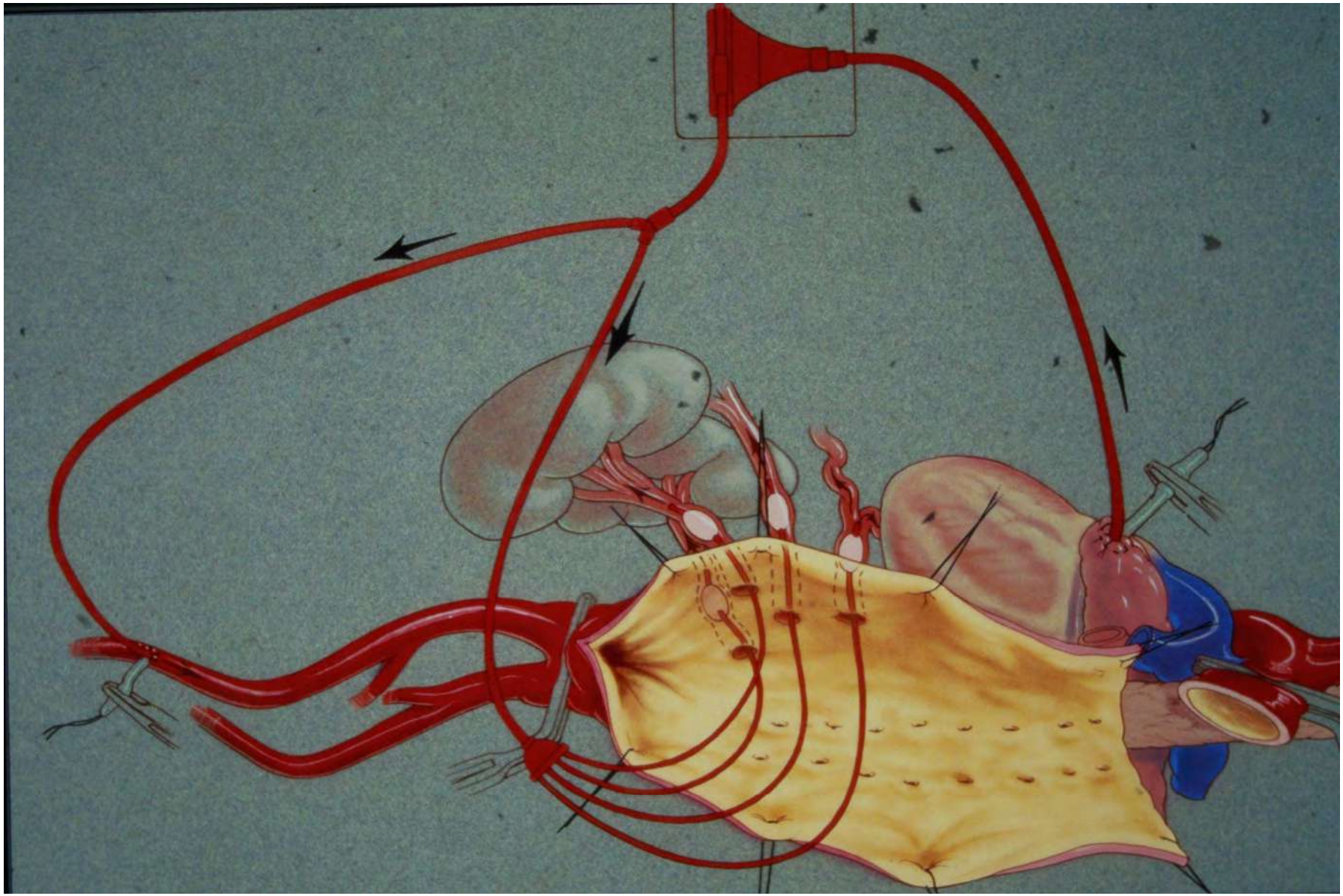
NEUROLOGICAL DEFICIT IN HIGH RISK PATIENTS WITH THORACOABDOMINAL AORTIC ANEURYSMS: THE ROLE OF CEREBRAL SPINAL FLUID DRAINAGE AND DISTAL AORTIC PERFUSION

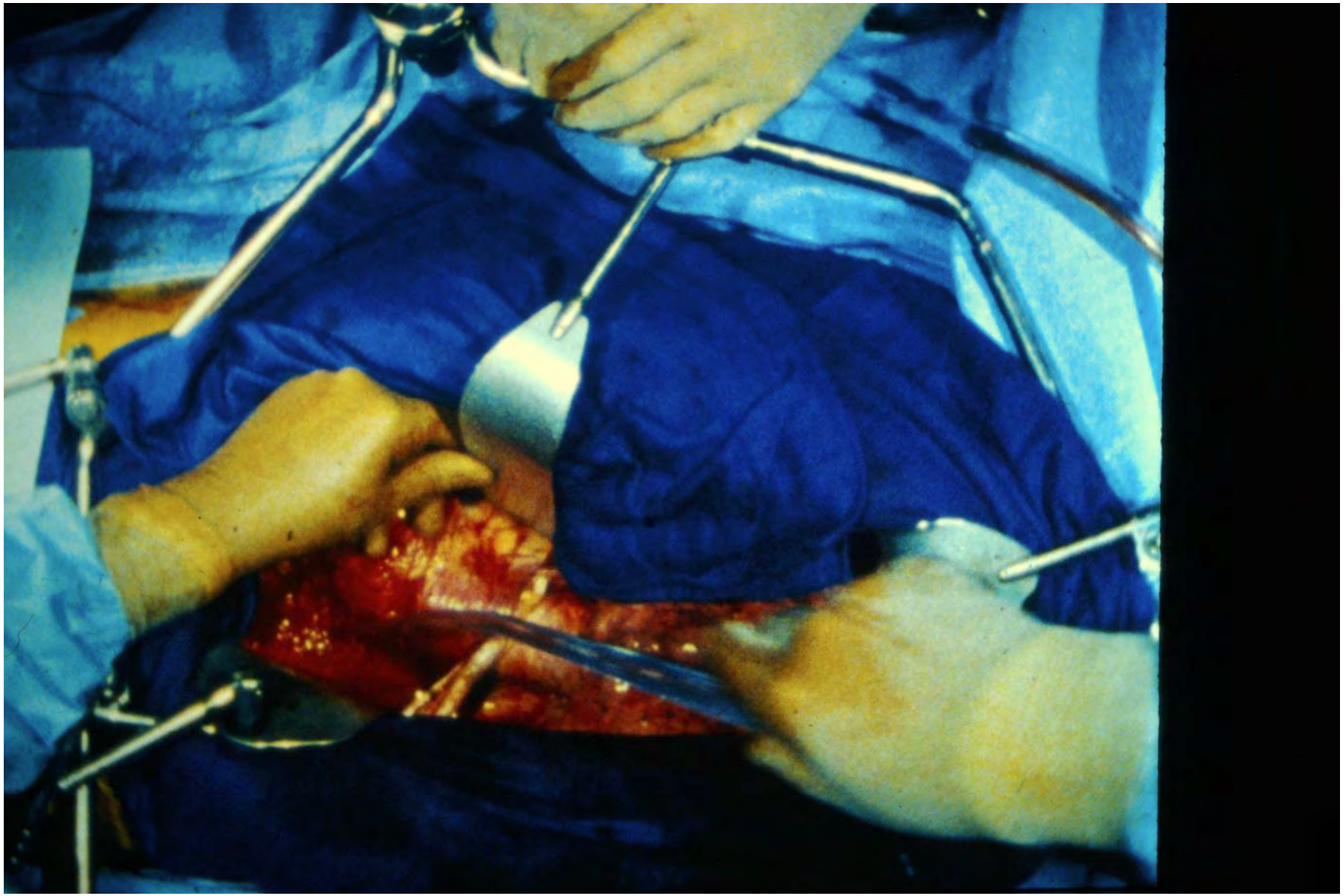
BAYLOR COLLEGE OF MEDICINE
METHODIST HOSPITAL
HOUSTON, TEXAS

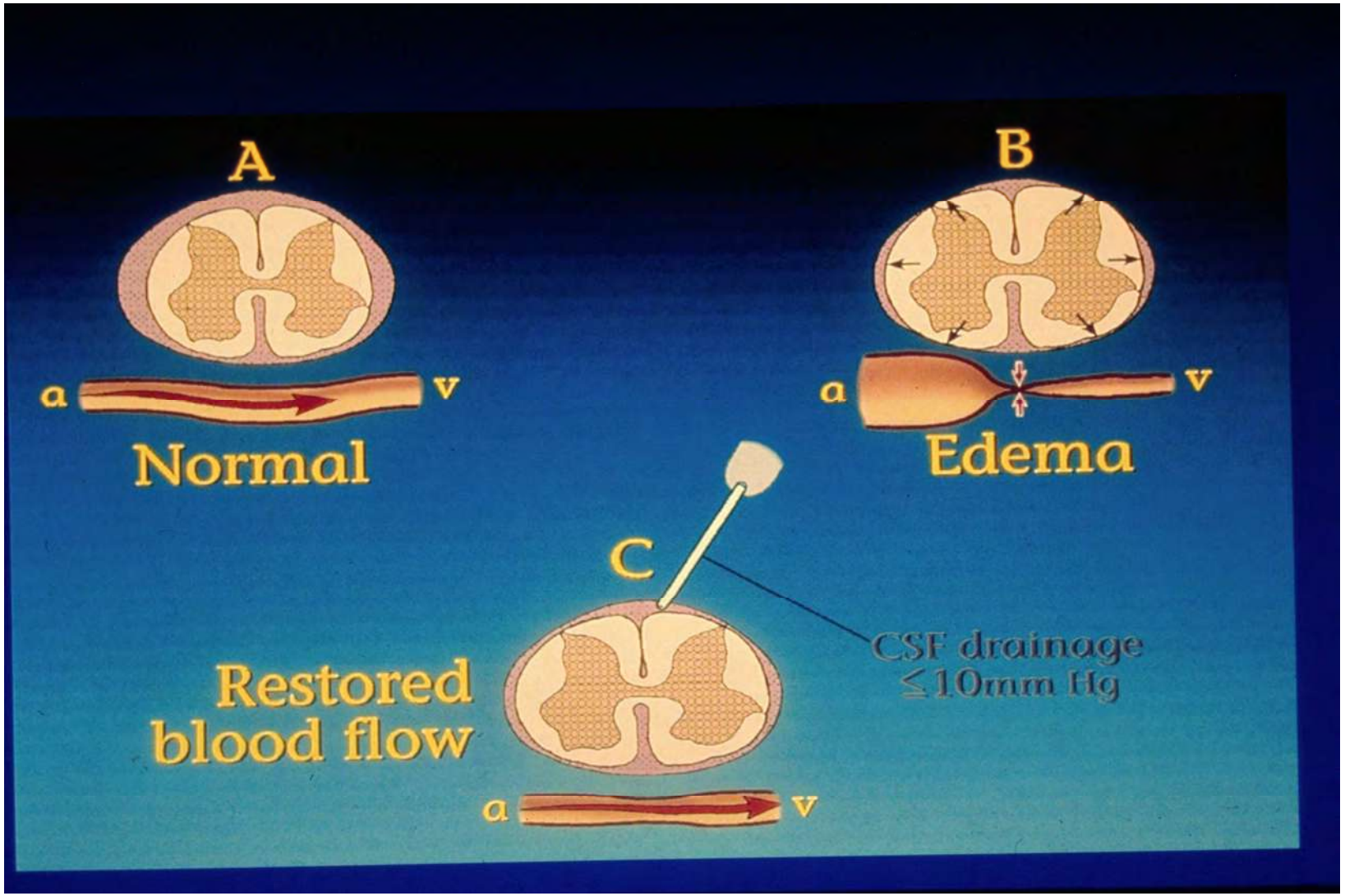
Hazim J. Safi, M.D., Stefano Bartoli, M.D., Kenneth R. Hess, Ph. D., Salwa S. Shenaq, M.D., Joseph R. Viets, M.D., Ghazala R. Butt, M.D., Roy Sheinbaum, M.D., Harold K. Doerr, M.D., Robert Maulsby, M.D. and Victor M. Rivera, M.D.




2
Intercostal and visceral perfusion
Biomedicus pump
Heat exchanger
©1995 Baylor College of medicine






A
a
v
Normal
B
a
v
Edema
C
CSF drainage
≤10mm Hg
Restored
blood flow
a
v

Cerebrospinal Fluid and TAAA

Keep Mean Arterial Pressure

Around 100mmHg

Every Time C.S.F. Pressure Measured

C.V.P. Measured

Cerebrospinal Fluid and TAAA

Patient is Flat

While Measuring C.S.F.

Call Service: 7064-7466-7072-7940

Increase C.S.F.

Neurological Deficit

Paraplegia: Immediate vs Delayed

- 21/31 (68%) Immediate
- 10/31 (32%) Delayed
- CSF Drainage Did Not Affect Incidence of Paraplegia

Cerebrospinal Fluid and TAAA

Aortic Cross-Clamping

Decreases Distal Aortic Pressure

Decreases Spinal Arterial Pressure

Increases Spinal Fluid Pressure

Cerebrospinal Fluid Drainage Paraplegia

- 31/98 (32%) Patients with Paraplegia
- Without Drainage
  - 17/52 (33%)
- With Drainage
  - 14/46 (30%)

TAAA

STUDY

September 18, 1992 - August 18, 1993

45 patients

36 ♂

9 ♀

Median age 63 (28 - 88)

CSF DRAINAGE & DISTAL AORTIC PERFUSION

COMPLICATIONS

Type II -31/45

Early	
Paraplegia	2 (6%)
Late	
Paraplegia	1 (3%)
Monoparesis	1 (3%)
TOTAL	4 (12%)

Cerebrospinal Fluid and TAAA

O.R. Day

C.S.F. >15mmHg

Withdraw Fluid Until

C.S.F. Pressure <15mmHg

Record/Hour

Cerebrospinal Fluid and TAAA

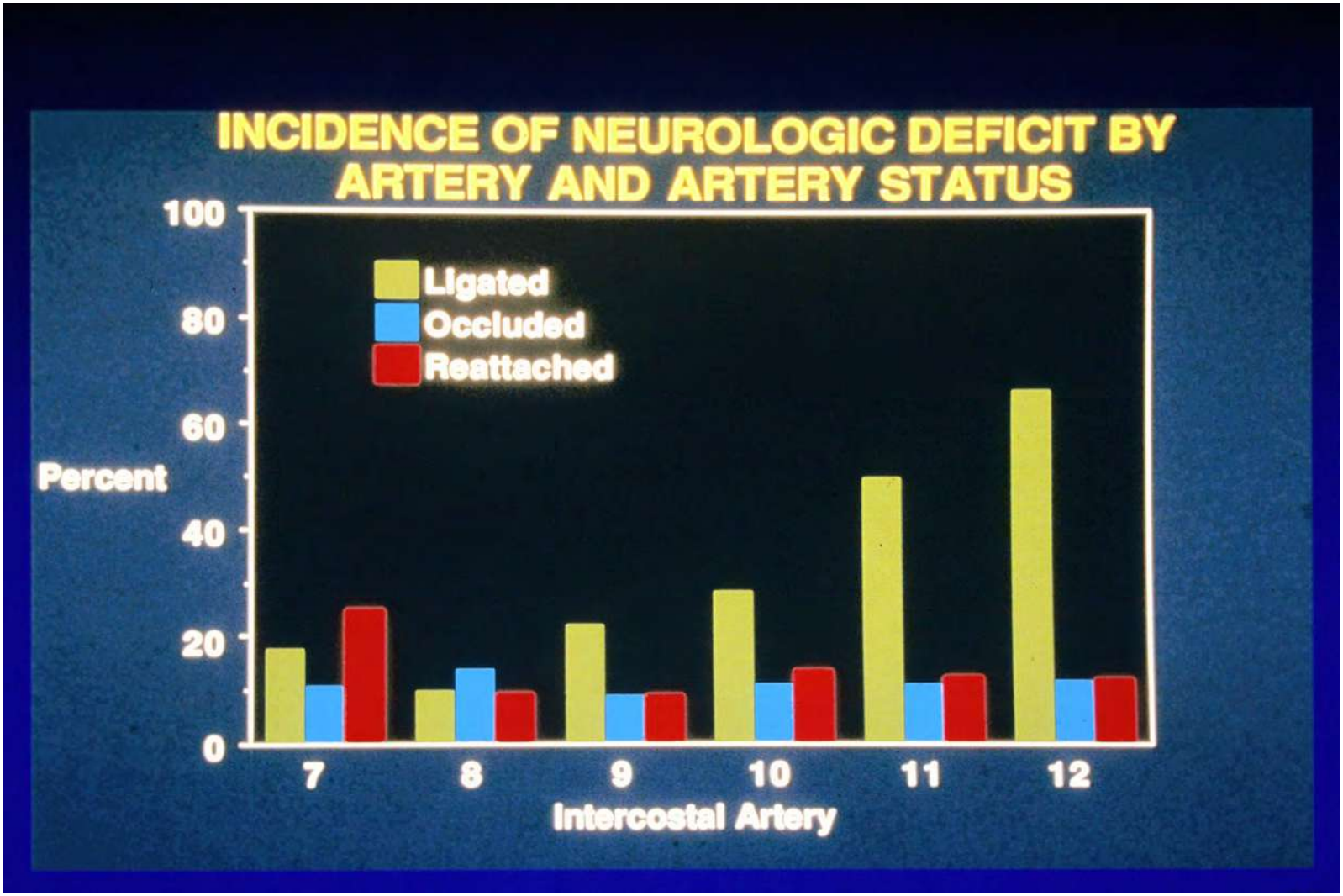
Patient is Flat

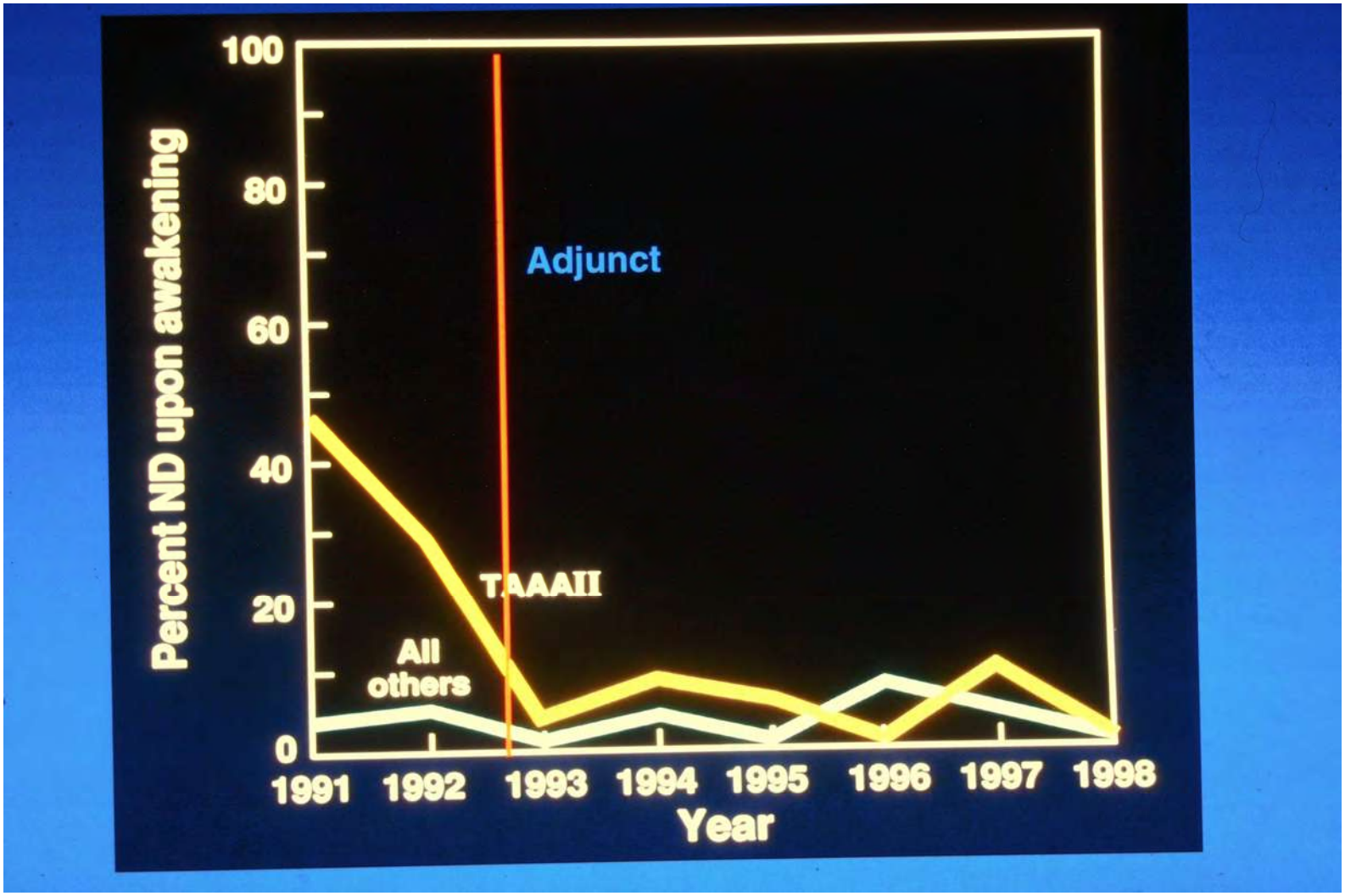
While Measuring C.S.F.

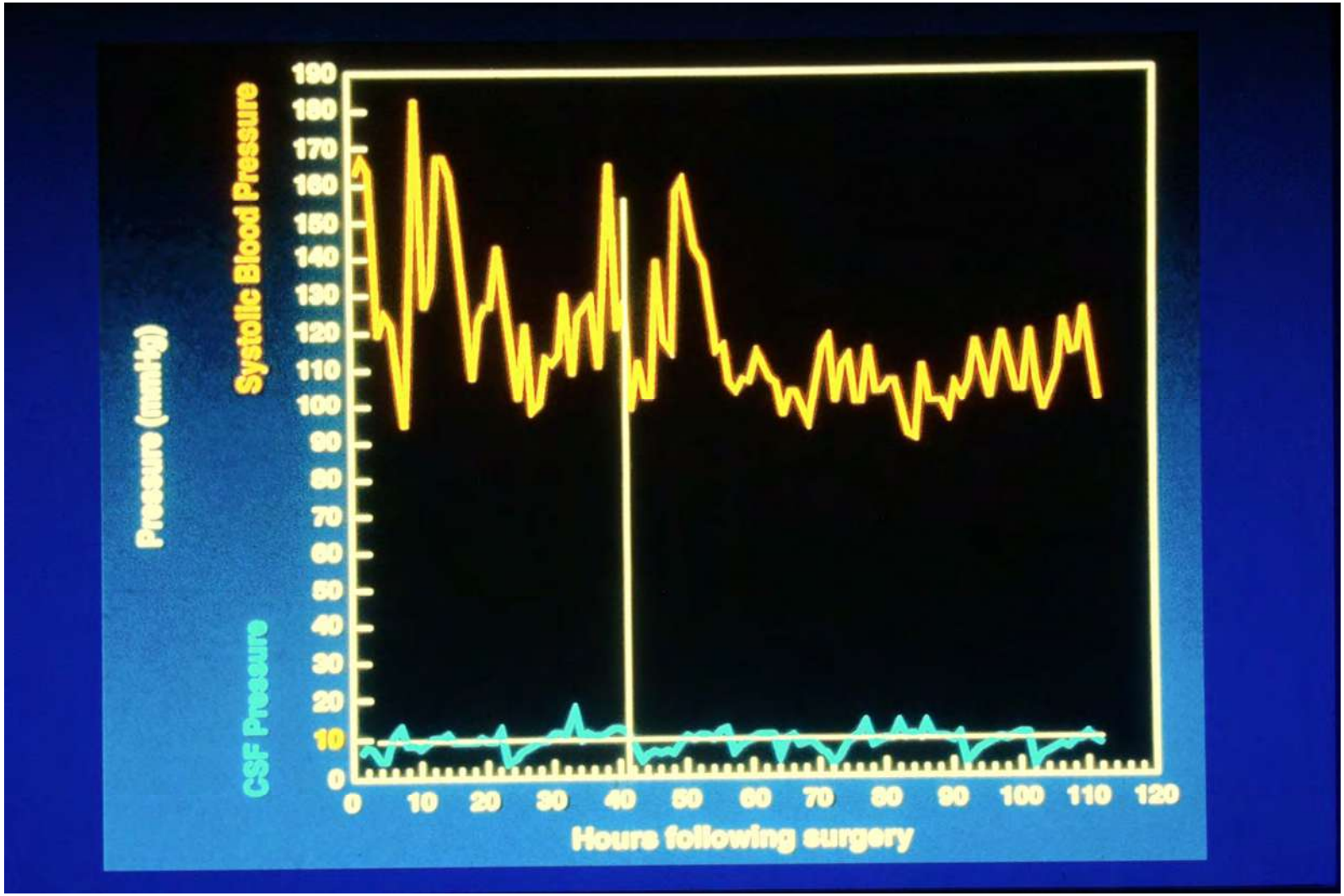
Call Service: 7064-7466-7072-7940

Increase C.S.F.

Neurological Deficit

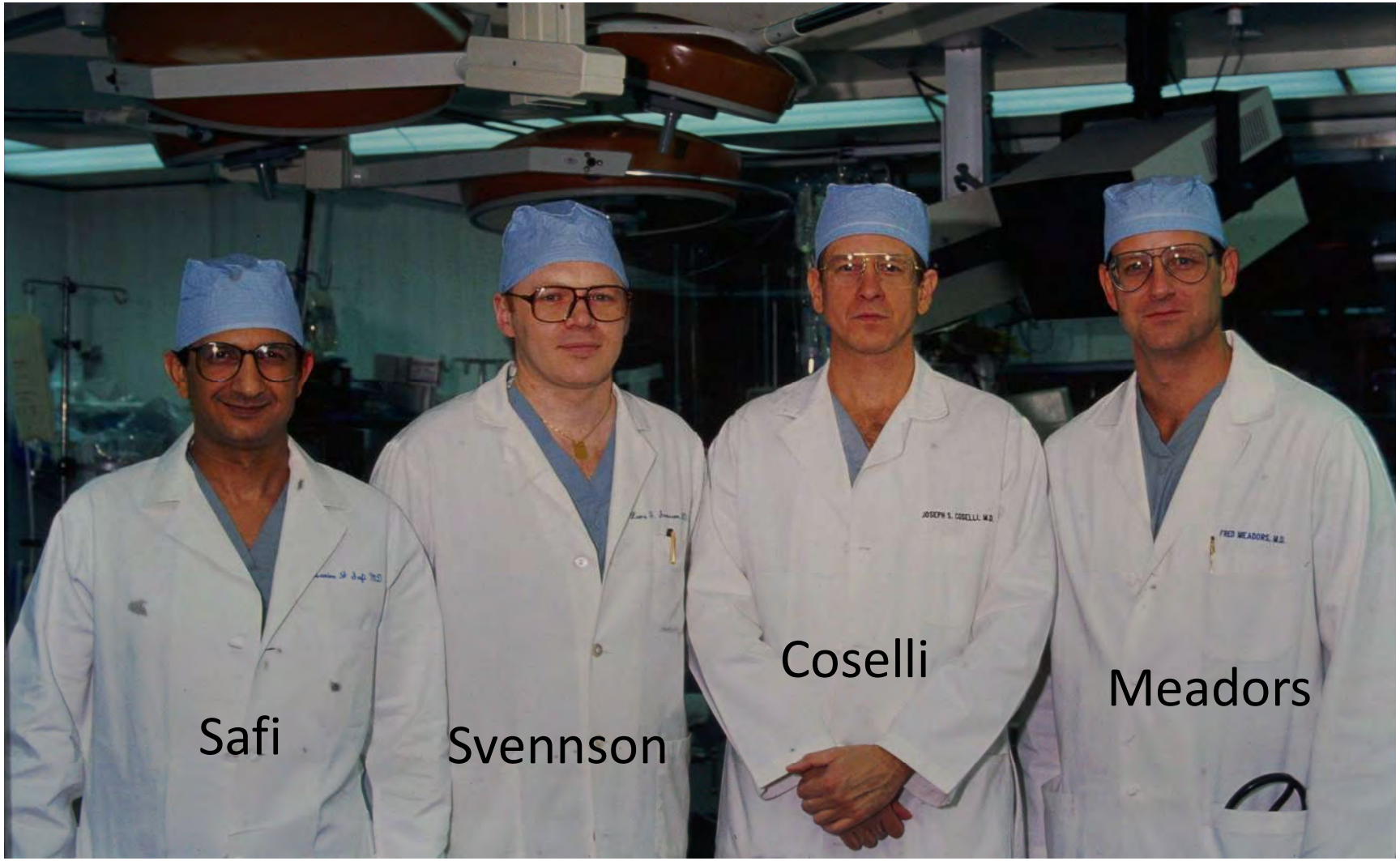

INCIDENCE OF NEUROLOGIC DEFICIT BY ARTERY AND ARTERY STATUS
100
80
60
40
20
0
Percent
Ligated
Occluded
Reattached
7
8
9
10
11
12
Intercostal Artery


Percent ND upon awakening
100
80
60
40
20
0
Adjunct
TAAAII
All others
1991
1992
1993
1994
1995
1996
1997
1998
Year


Pressure (mmHg)
Systolic Blood Pressure
CSF Pressure
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
110
120
Hours following surgery

People


16 6'92



1991

STS 1/2020


MEMBER
MEMBER


POW!
AAARGH! IT'S
AMERITECH MAN

Thank You

Department of
Cardiothoracic &
Vascular Surgery

UTHealth Houston
McGovern Medical School

UTH_CVSurgery
info.ctvs@uth.tmc.edu
https://med.uth.edu/cvs/