
Magical
Moments
in
Vascular
Surgery

Lambert residence 29 W 56th St

Rockefeller Institute

Adrian Van Sinderin Lambert (1872-1952)

P&S 1896 MD following father, uncle & two brothers

Anatomy/pathology in Vienna, Berlin, & Munich
Neuro, general, trauma, and thoracic surgery

22nd President of Am Assoc for Thoracic Surg

Alexis Carrel of Ste.-Foy-les Lyon (1873-1944)

University of Lyon 1900 MD, (Mme Leroudier)

1904 Chicago, Charles Guthrie; 1906 Rockefeller,
transplanting organs, limbs and heads

1912 Nobel Prize in Physiology or Medicine

Medical Record May 30, 1908; pg. 885

Original Articles.

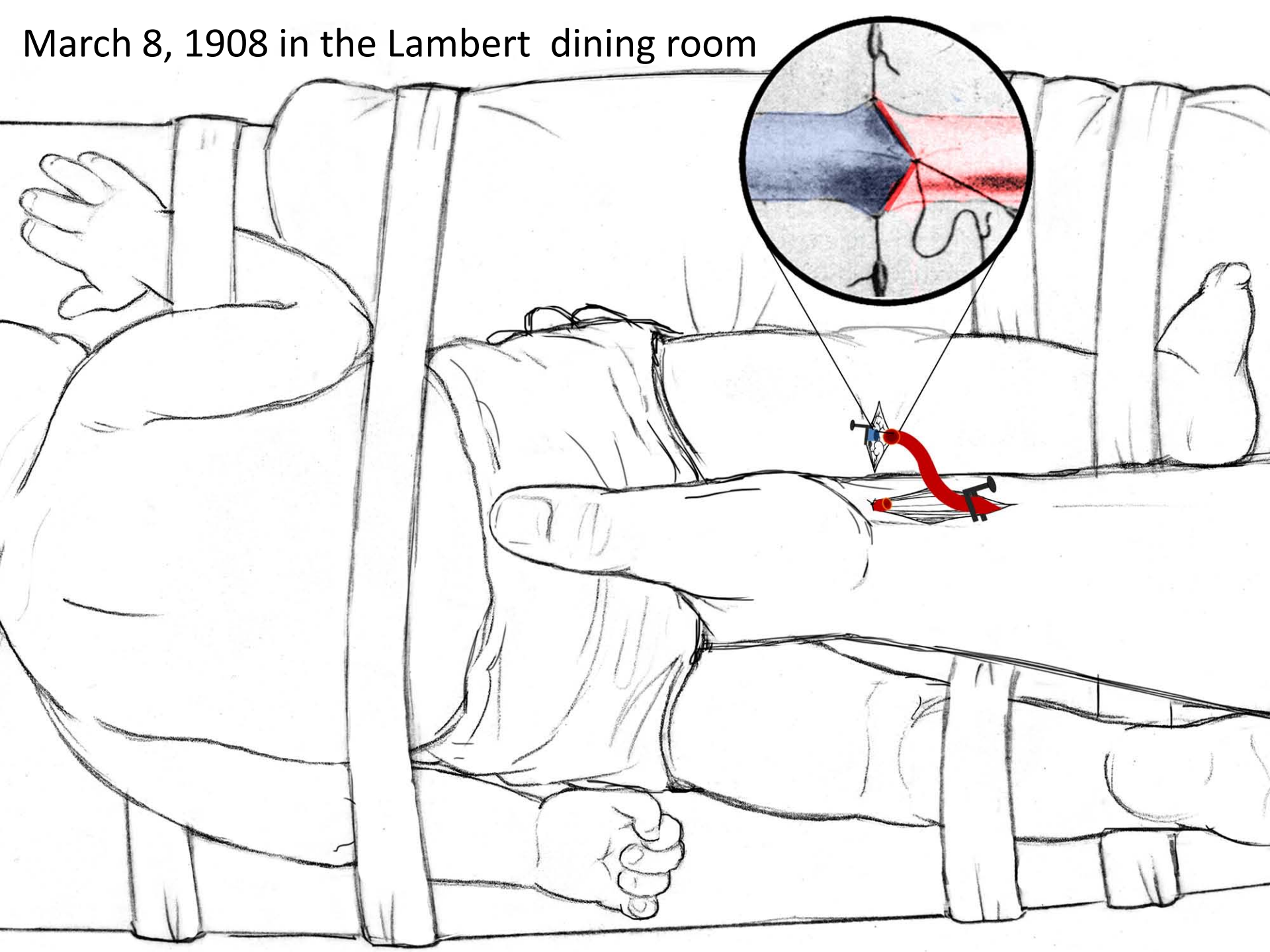
MELÆNA NEONATORUM WITH REPORT OF A CASE CURED BY TRANSFUSION.

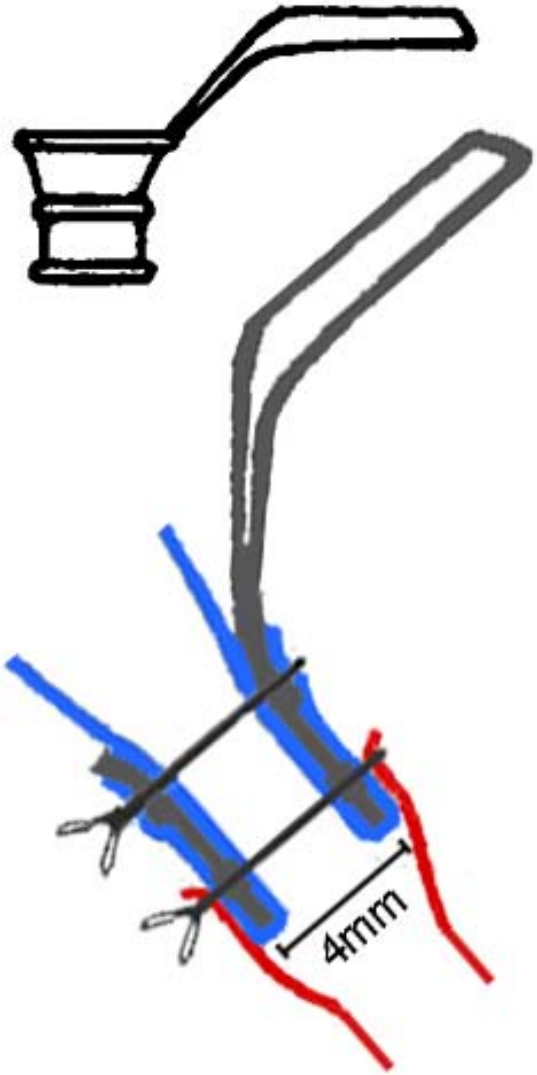
By SAMUEL W. LAMBERT M.D.

NEW YORK.

On the morning of March 8 the case seemed hopeless. During this day the baby's skin was waxen white and the mucous membranes without color; the nasal bleeding was continuous; the vomited matter contained food curds, dark blood, and at times bright clots; the stools were frequent and contained bright red blood; the subcutaneous hematoma on the scalp increased until the right eye was closed and ecchymotic spots appeared on the legs.

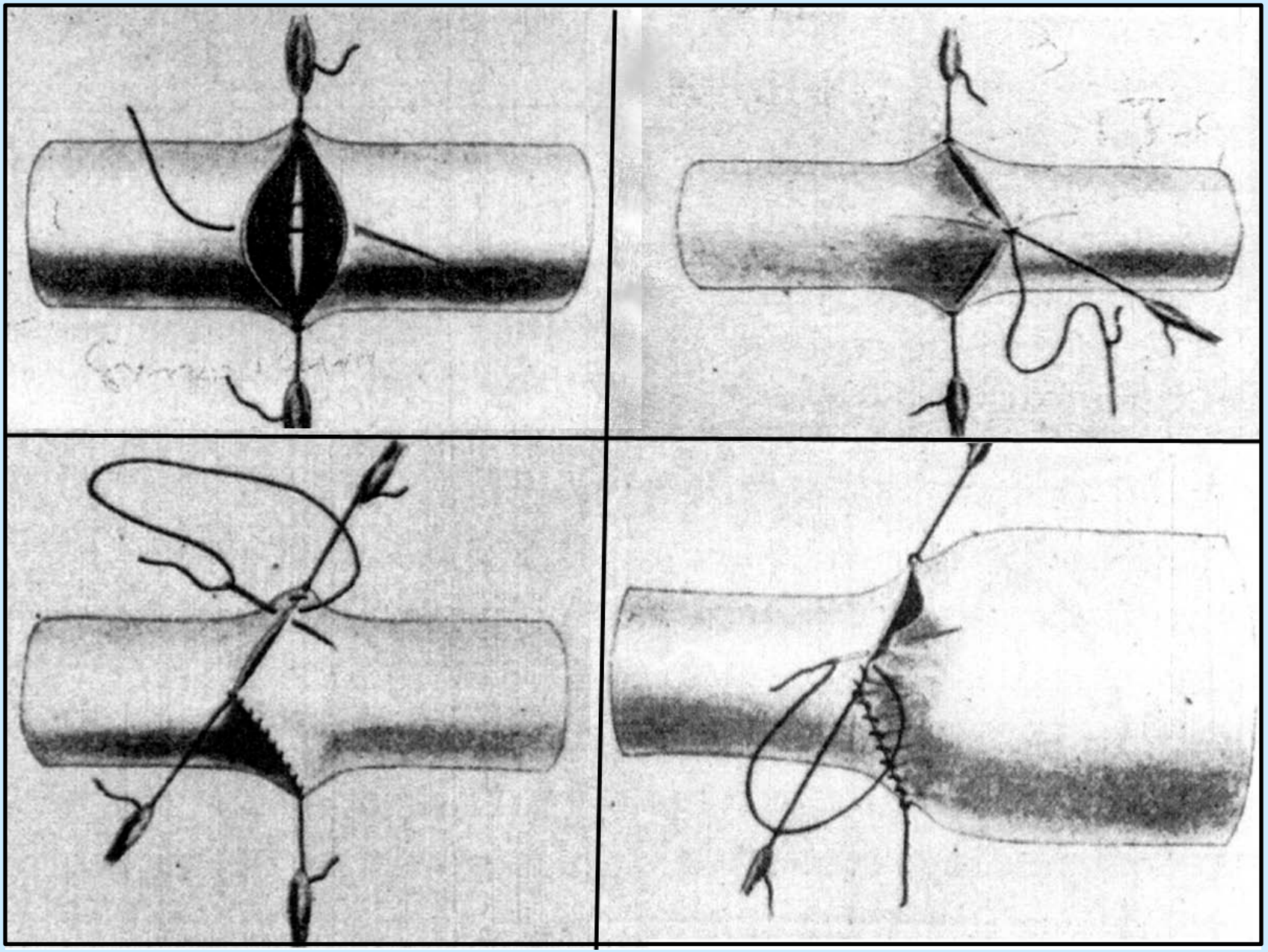
March 8, 1908 in the Lambert dining room



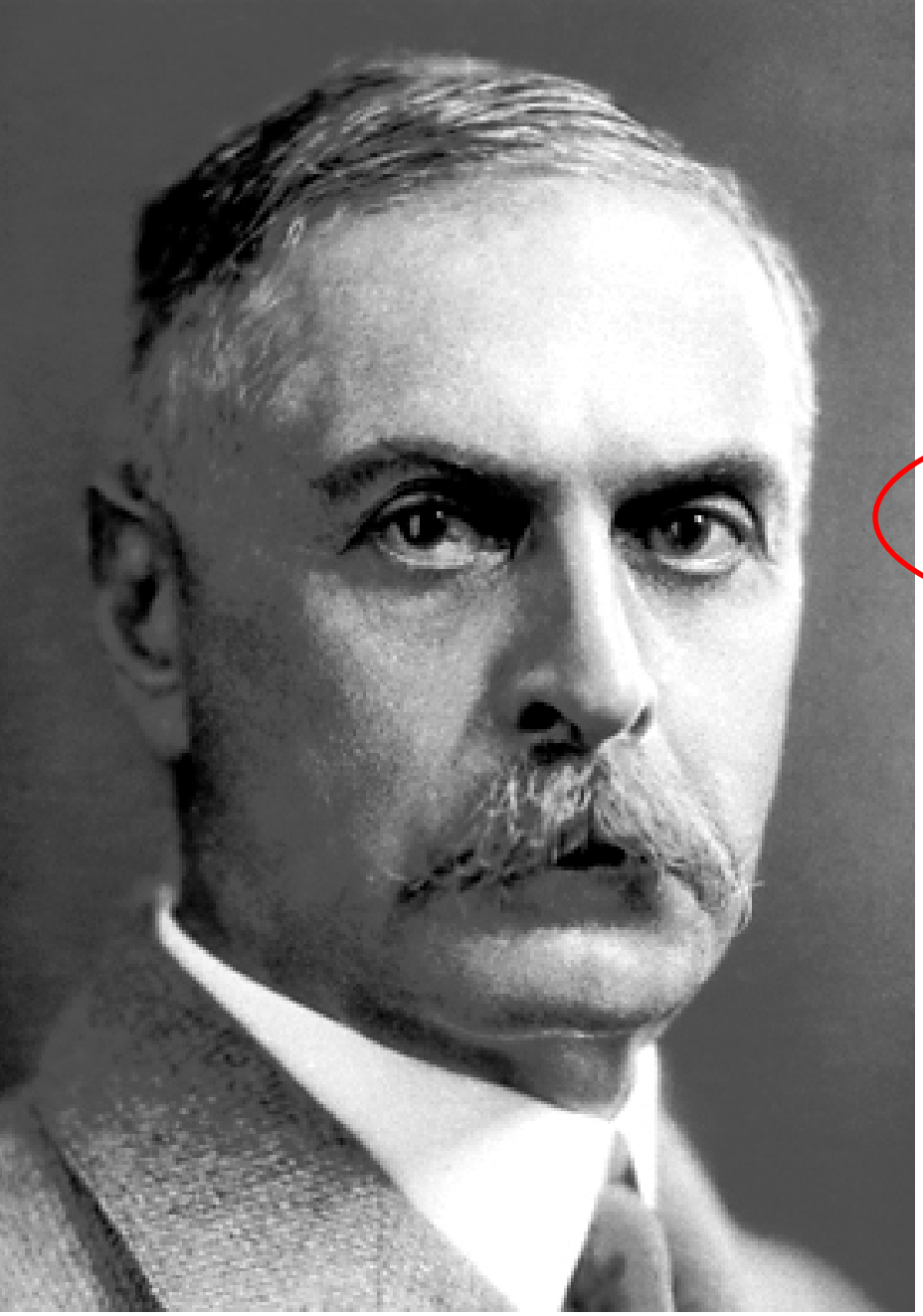


Crile G. The technique of the direct
Transfusion of blood.
Ann Surg 1907;46:329-32.

George Washington Crile, Sr.
(1864-1943)



Carrel A. La technique opératoire des anastomoses vasculaires et la transplantation des viscres. Lyon Méd 1902:98:859-64.



Karl Landsteiner (1868-1943)

1900 A B C (O) Hemagglutinins in Vienna

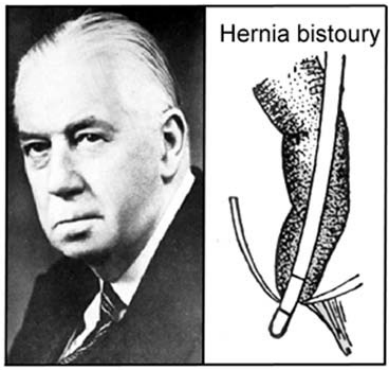
1907 Cross matching (Ruben Ottenberg at Mt. Sinai in New York)

1915 Citrate clot inhibition (Richard Lewisohn at Mt. Sinai)

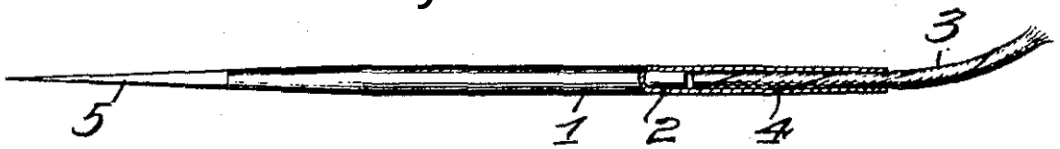
1923 To Rockefeller Institute. Haptens - incomplete antigens

1930's Phylogenetic conservation of blood groups.

1937-40 Discovery and characterization of Rh factors and relation to erthroblastosis fetalis with Philip Levine and Alexander Weiner.

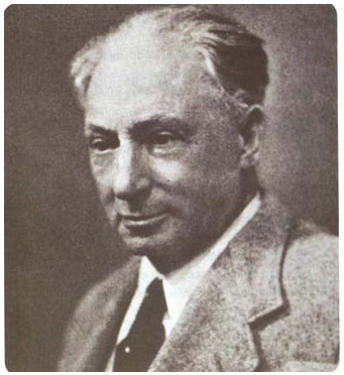


1925 Henry Souttar – Trans-atrial mitral "commissurotomy" in London



Patent No. 15901021 Filed Sept 27, 1924 Issued July 6, 1926 to Charles T. Davis, assignor to Davis & Geck Inc., Brooklyn, NY.

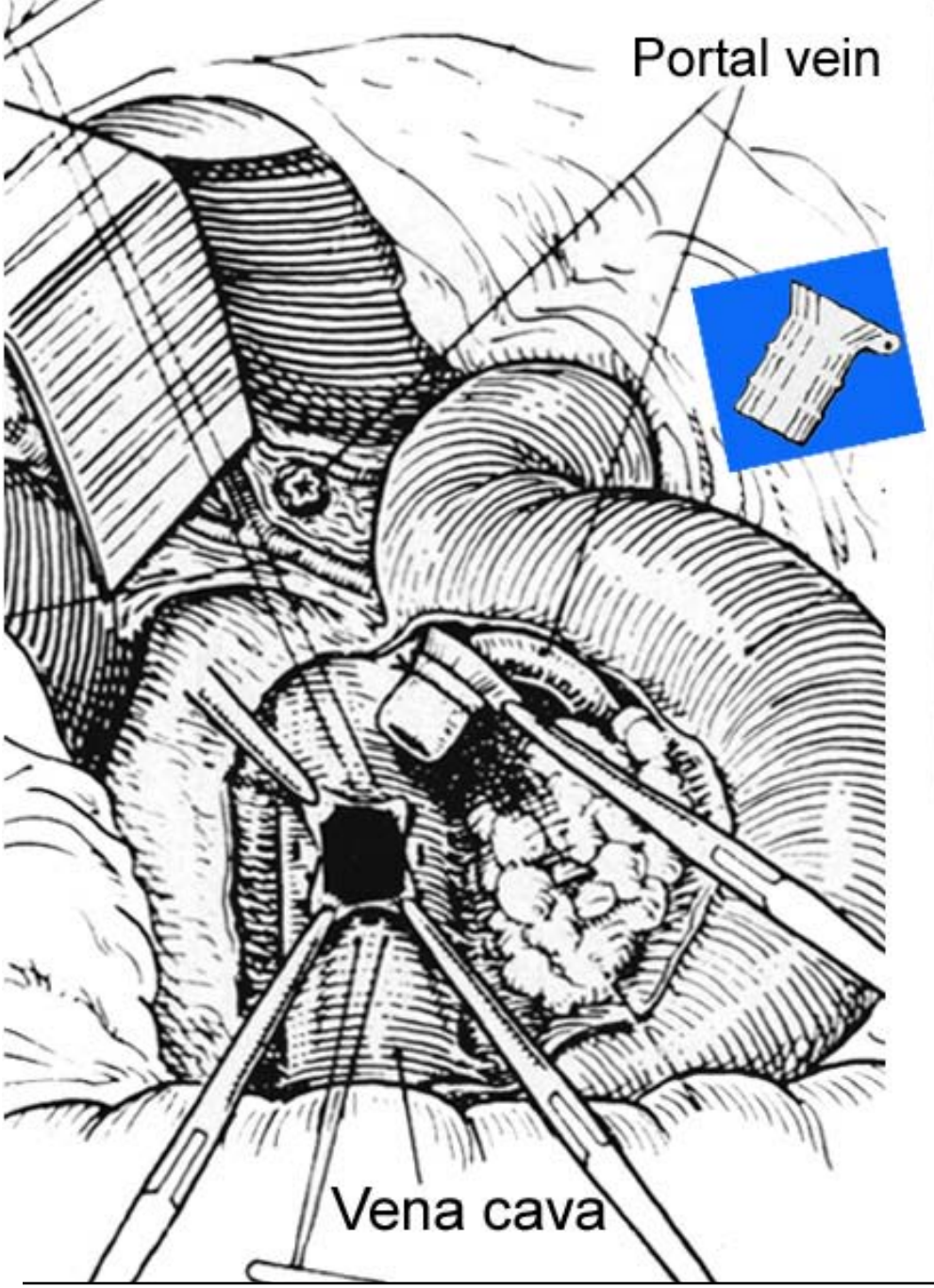
1927 Egas Moniz – Direct stick cerebral arteriogram

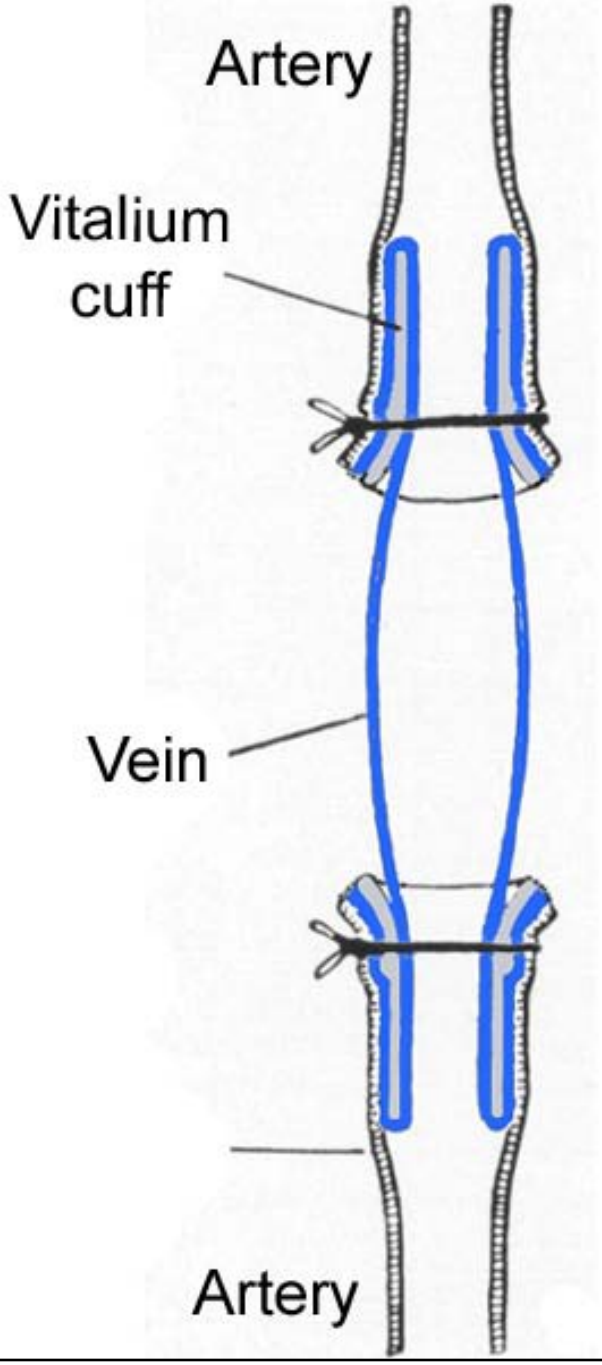


Lisbon

1929 Renaldo Cid dos Santos – lumbar aortogram

1944 Blalock-Taussig Shunt



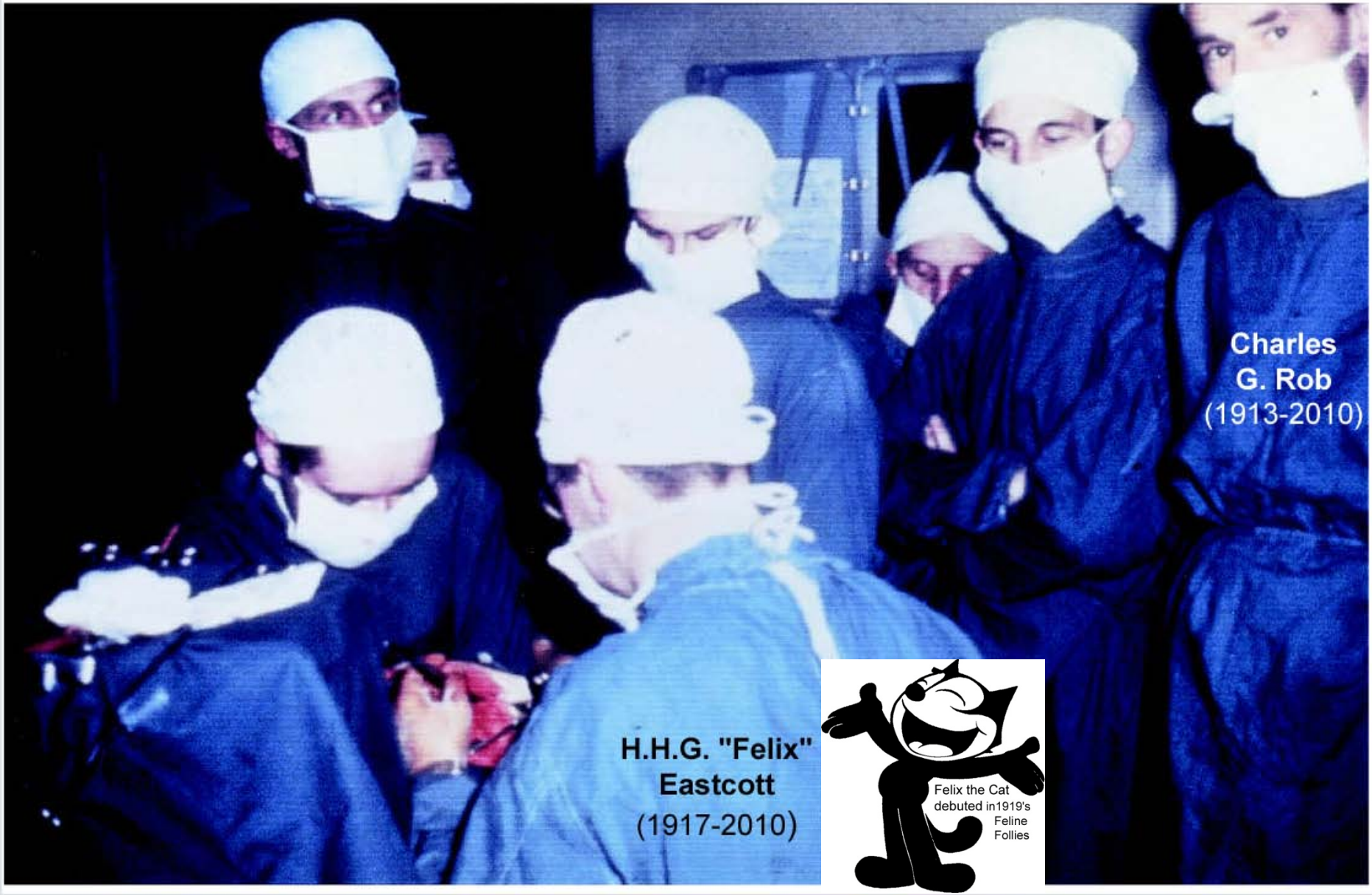


Blakemore AH, Lord JW Jr, Stefko PJ. Restoration of blood flow in damaged arteries. Ann Surg 1943(Apr);117:481-97.

Rosenthal D. Thirteen Days in May.
J Vasc Surg 2002;36:430-6.

3 min 59.4 sec, on Oxford's Iffley Road Track
May 6, 1954


ST. MARYS HOSPITAL
CLARENCE
MEMORIAL WING

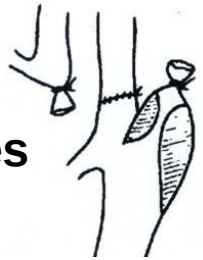


66 year old Ada Tuckwell, 4 mo hx of recurrent transient (10-30 min) right hemiplegia & unilateral blindness. St. Mary's Hospital, May 19, 1954

Carotid Surgery's Pre-NASCET/ACAS Evolution

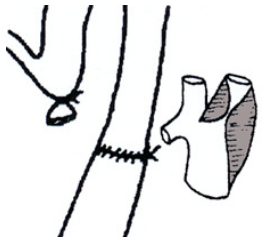
❖1913 New Yorker, J. Ramsey Hunt connects extracranial lesions & brain ischemic events at the Am Neurological Assoc "neurological claudication."

1951 Buenos Aires neurosurgeon Raul Carrea transects IC distal to its obstruction & attaches it to the transected EC stump.



❖1953 DeBakey performs a successful carotid thromboendarterectomy on a patient who survived without neurological symptoms for another 20 years.

❖1954 Eastcott's IC-CC variation on Carrea's procedure belatedly awakens the world to Hunt's prescience.



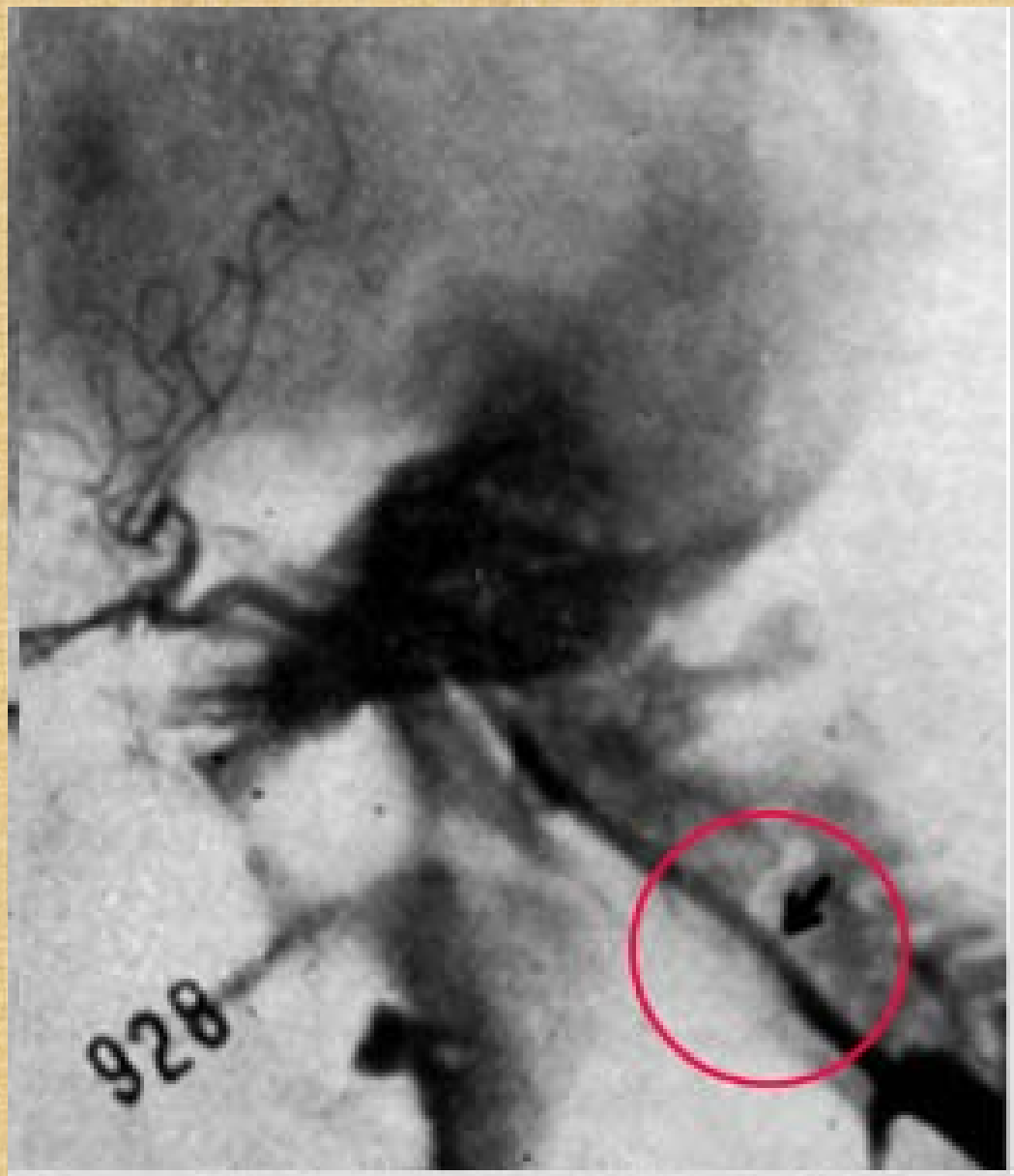
❖1988 The Rand corporation classifies 13,000 carotid endarterectomies as appropriate, equivocal, or inappropriate in nearly equal proportions → RCTs

Frank L. Gerbode
(1907-84)

Michael E. DeBakey
(1908-2008)

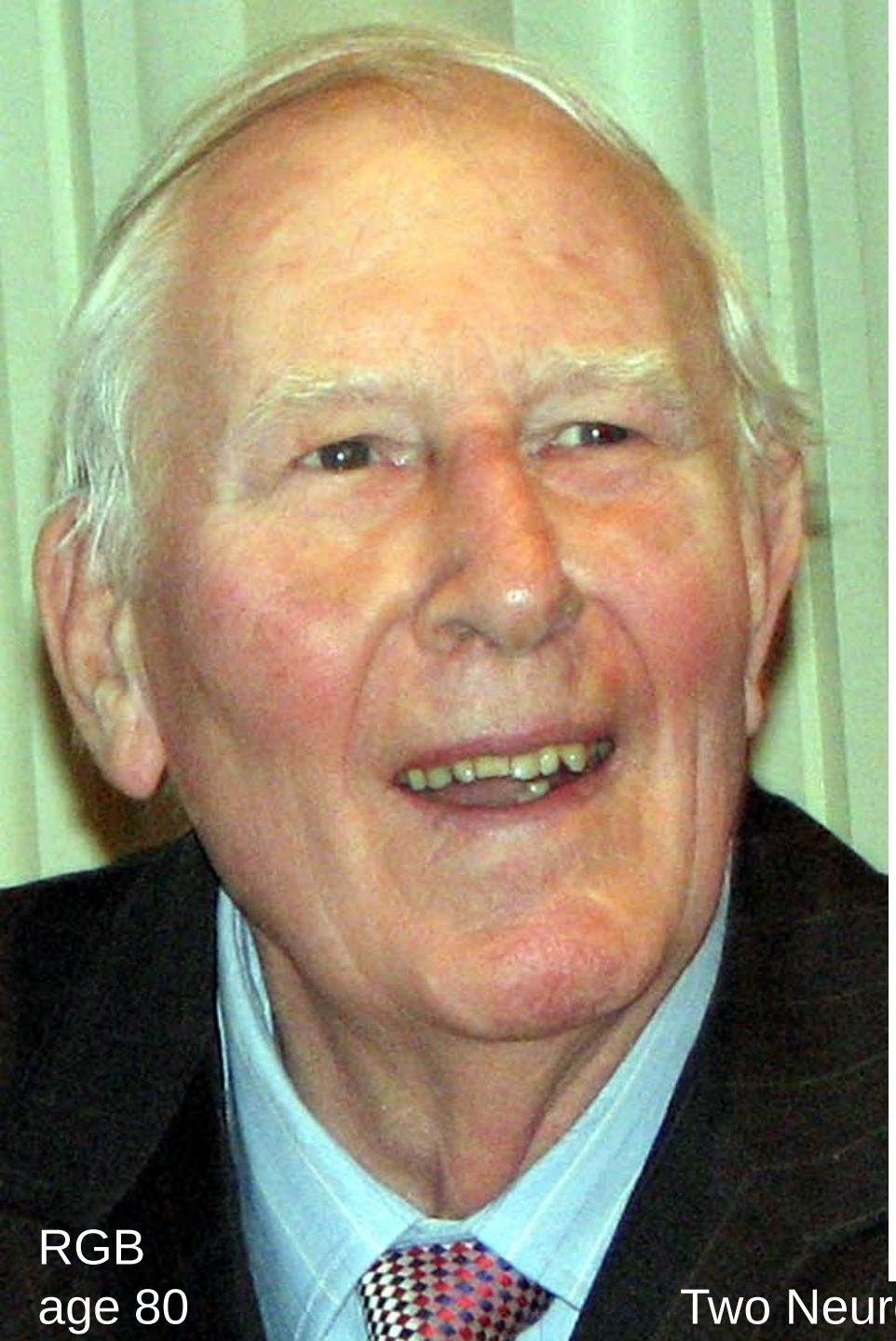
Good Press:

E. Jack Wylie, Gerbode, De Bakey, and George R. Dunlop of Worcester, MA (who took the picture) observed portions of the operation.



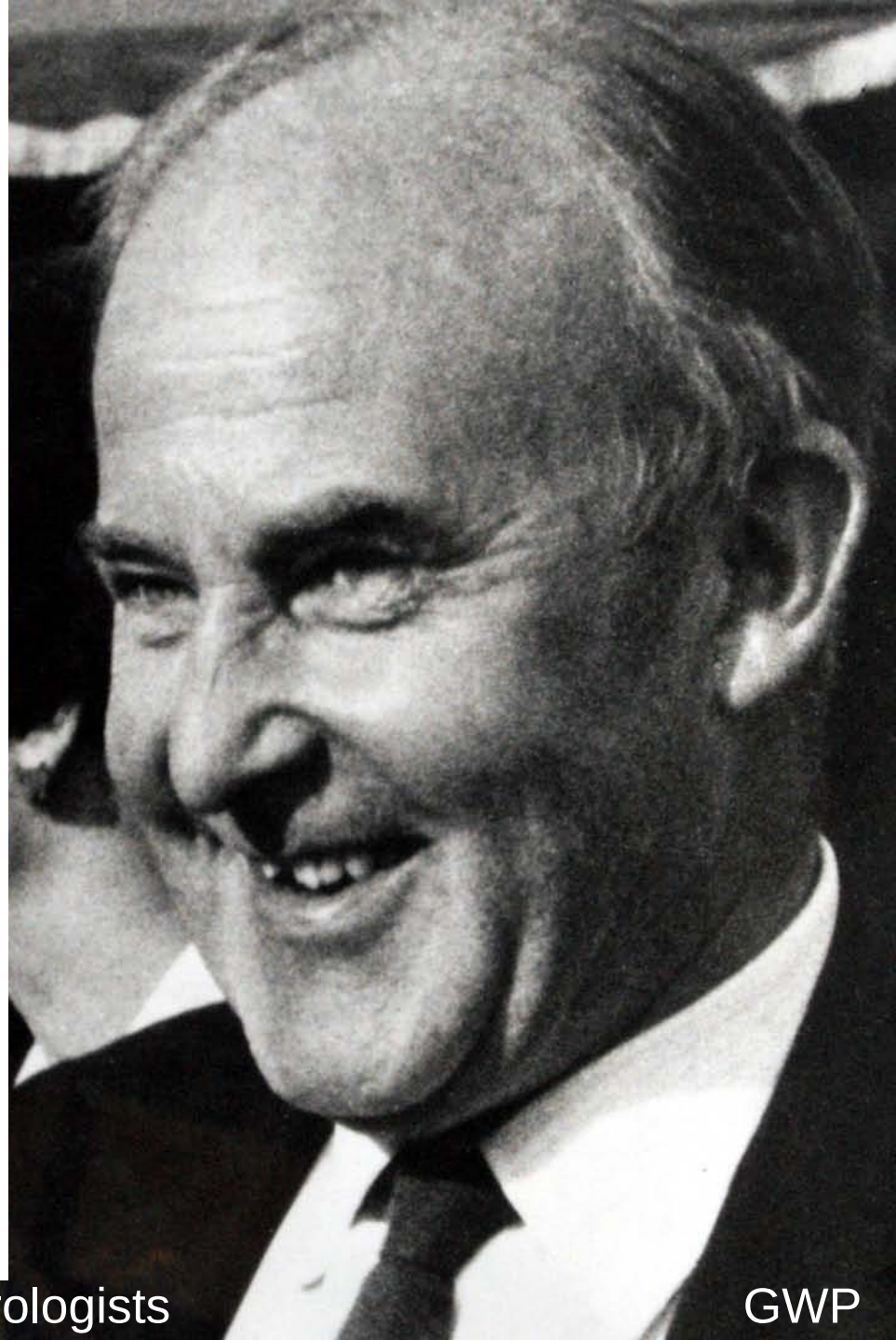
Eastcott HHG, Pickering GW, Rob CG. Reconstruction of internal carotid artery in a patient with intermittent hemiplegia. Lancet Nov 13, 1954;2:994-6.

“Hope and Crosby” in 1960



RGB
age 80

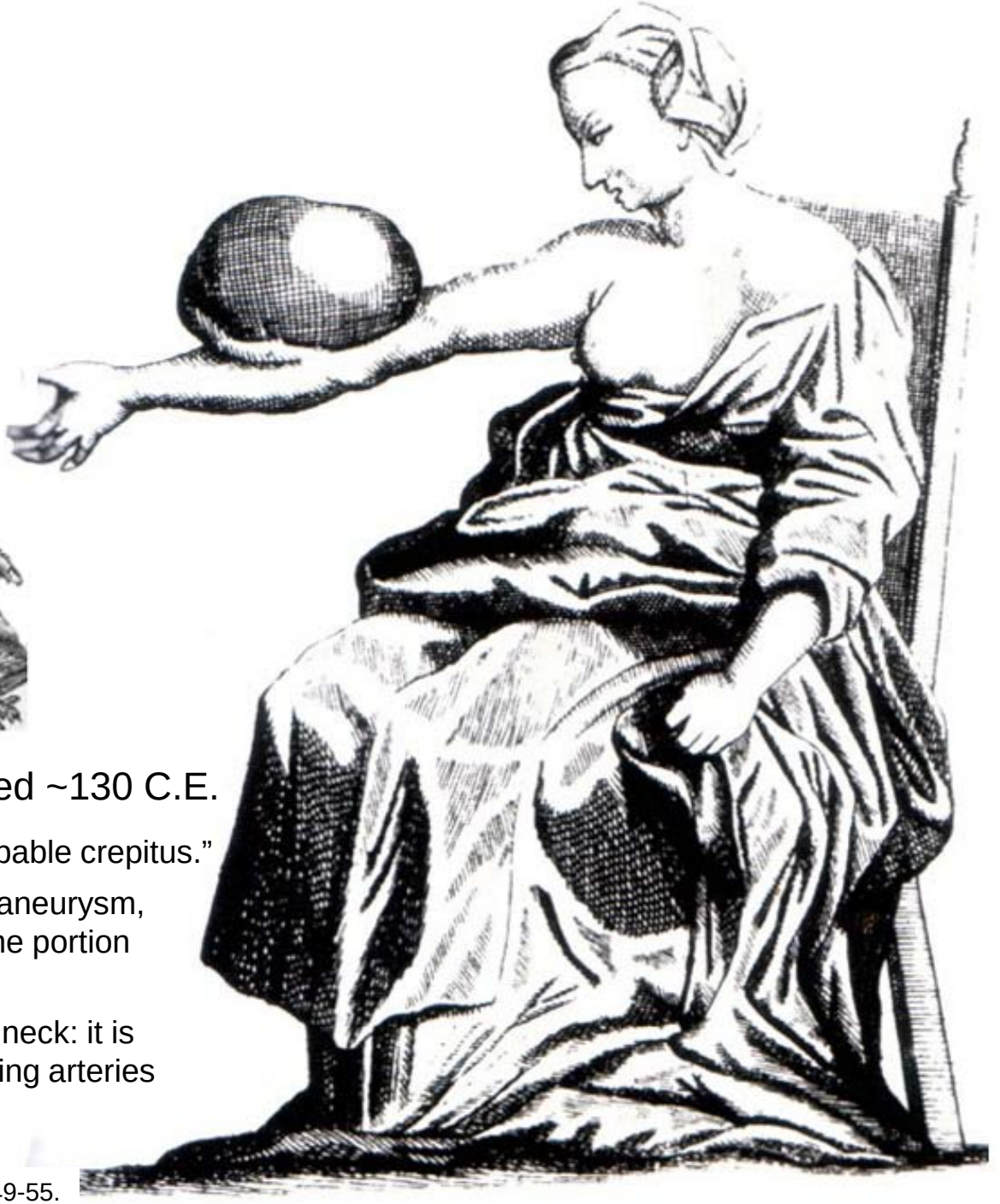
Two Neurologists



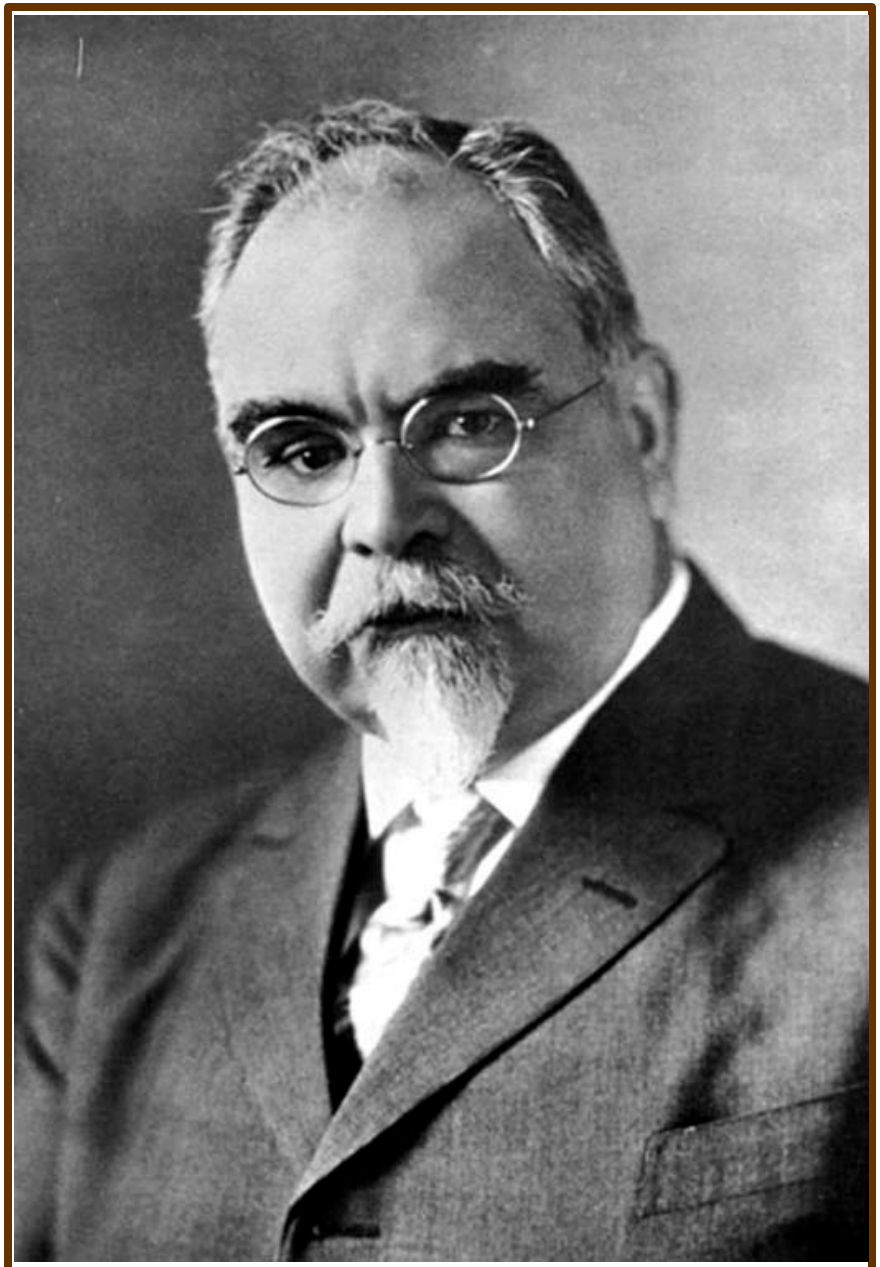
GWP

Antyllus, a Greek physician practiced ~130 C.E.

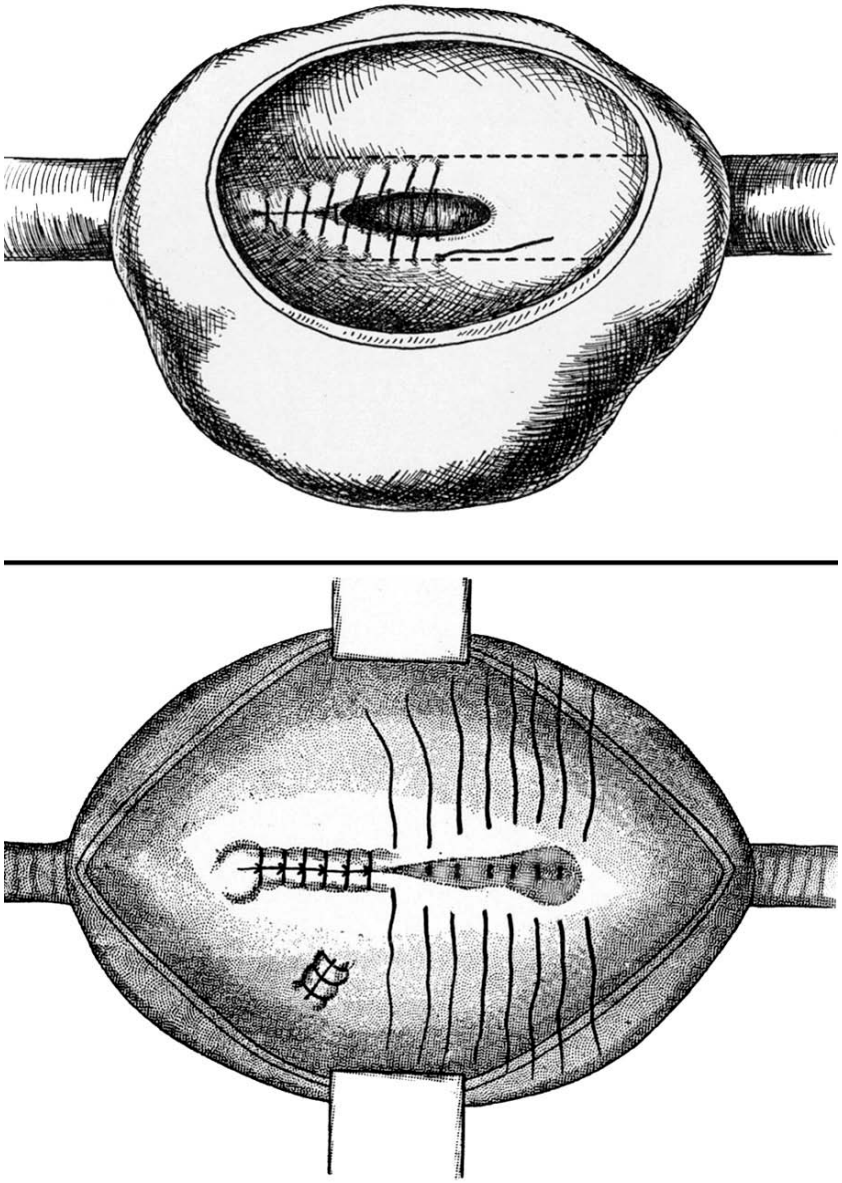
- Expansion vs. contained rupture with “palpable crepitus.”
- Proximal + distal artery ligation, open the aneurysm, excise its superfluous part but leave the portion bridging the ligatures.
- Do not treat those of the arm pit, groin, or neck: it is impossible to isolate and tie their feeding arteries



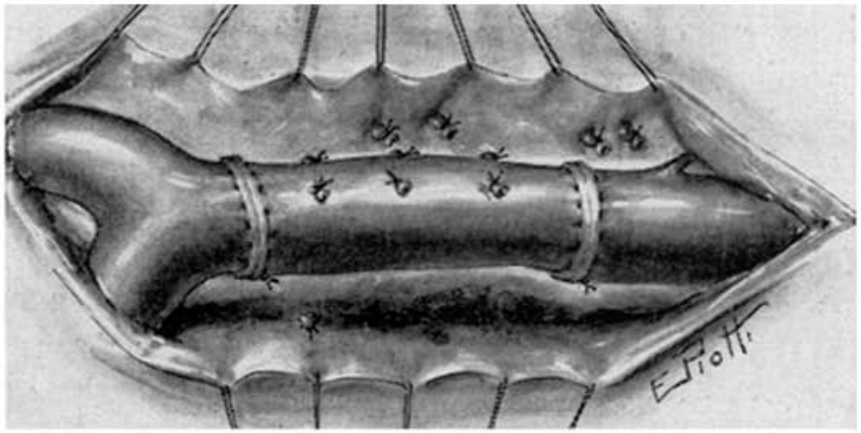
Osler W. Arterio-venous aneurysm. Lancet 1915;1:949-55.



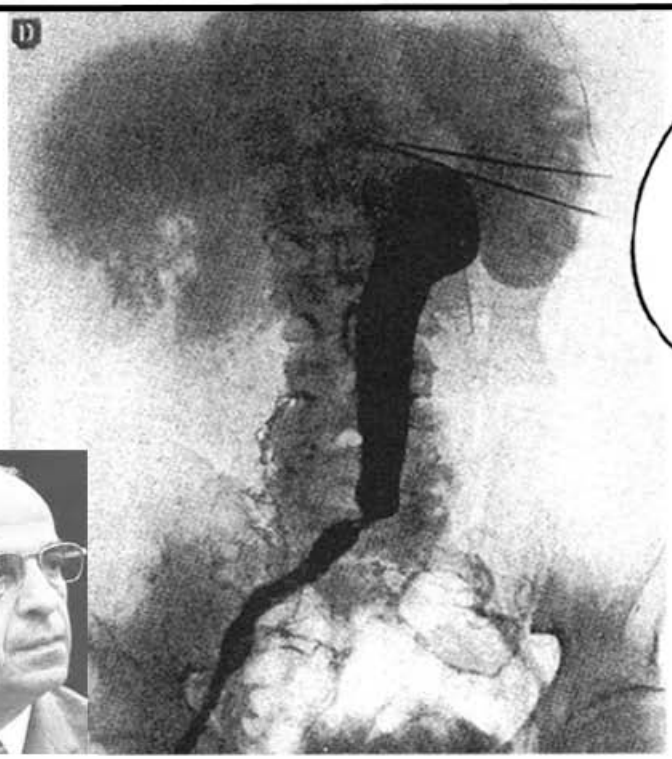
Rudolph Matas (1860-1957)

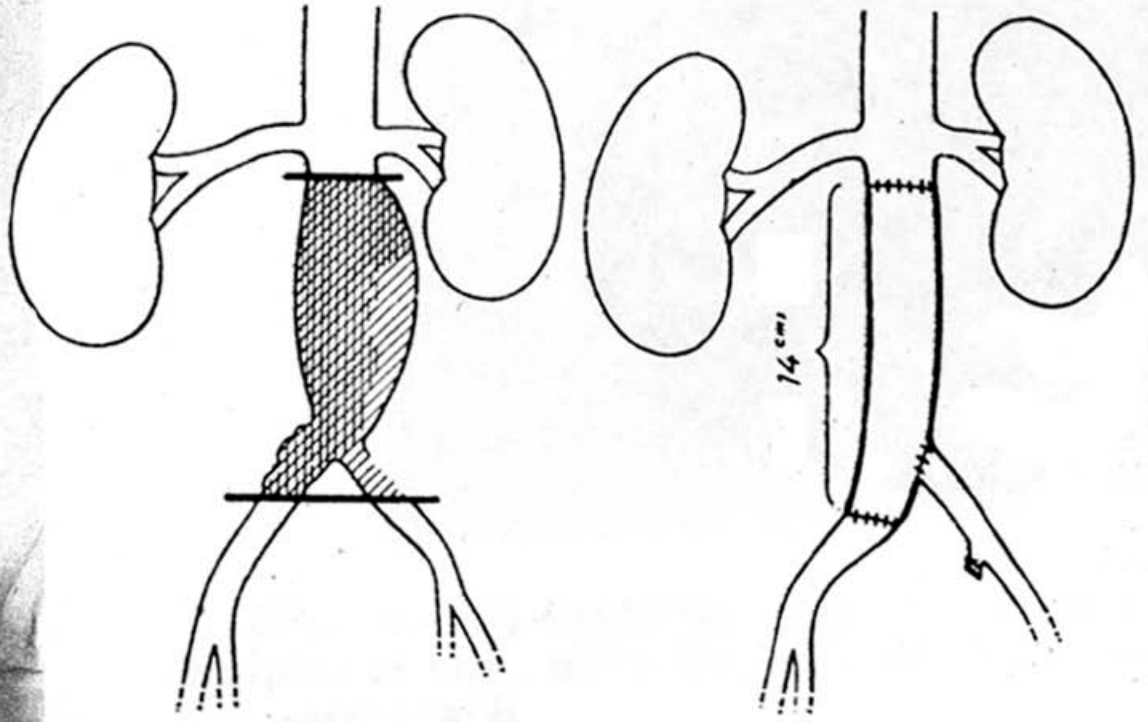


An operation for the radical cure of aneurysm based upon arteriorrhaphy. Ann Surg 1903;37:161-96. **(35 pgs)**



Robert E. Gross: First aortic aneurysm homograft replacememt in 1949 (first homograft 1948).





Charles Dubost: 1st infrarenal aneurysm homograft replacement in 1951.

Arthur B. Voorhees Jr.
(1921-1992)

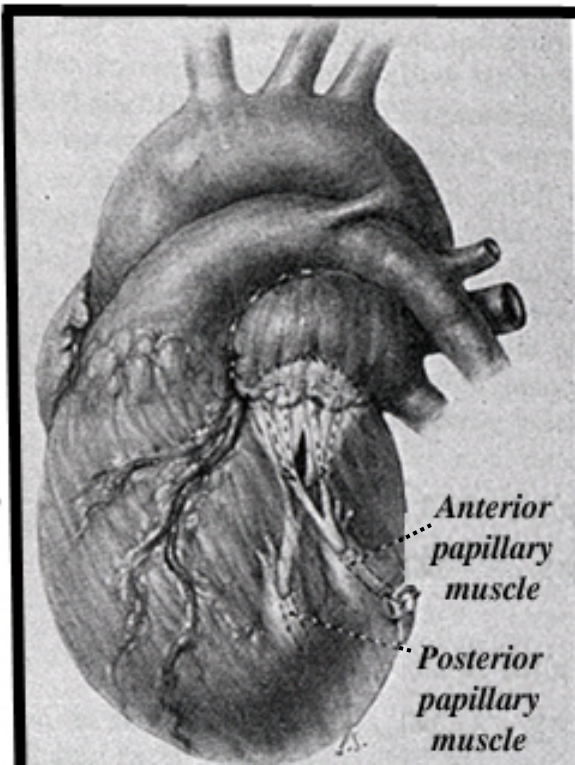
Army's 3 + 3 ⟶ 1946 P&S MD 6 y after highschool

Intern +1-y fellowship: canine mitral valves out of allograft IVC flaps with silk chordae tendinae.

1948-49: Brooke Army Surgical Research: aortic nylon parachute cloth replacements with a 1-mo survivor.

Columbia P&S

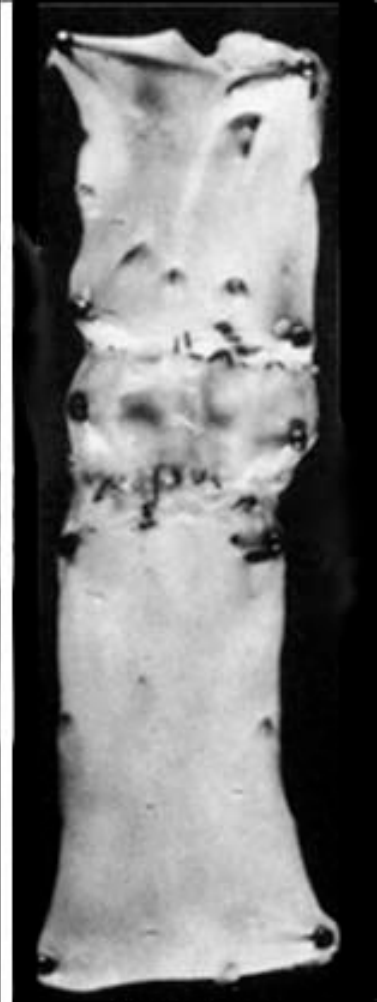
1950-53: Orthopedic resident J. Wallace Blunt, Jr. suggests Vinyon-N cloth. Art Voorhees implants V-N aortic prostheses in 30 dogs with 75% >1-month survival.



Union Carbide’s Vinyon “N” woven cloth & thread


300X

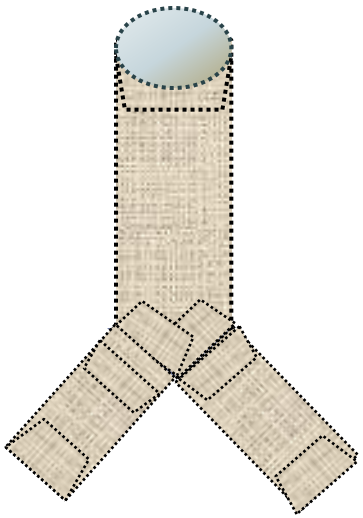
Art Voorhees with
dog 627A in 1957



Canine
Vinyon-N
aortic graft
in 1959
8 years after
implantation

17 Infrarenal AAA's Resected May 1953-Mar 1954

Blakemore AH, Voorhees AB Jr. Ann Surg 1954(Sept);140:324-33.



- 10 Abdominal or back pain with pulsatile mass
- 8 Extended into the common iliacs
- 3 Previous AAA wiring
- 8 Died in the hospital
  - 3 Fatal hemorrhages & an infarcted L kidney related to proximal clamp placement
  - 4 Died of hemorrhage-related organ failure
  - 1 Death with L limb graft thrombosis
- 8/9 Discharged patients were alive for 3-10 mo

17 Infrarenal AAA's Resected May 1953-Mar 1954

Blakemore AH, Voorhees AB Jr. Ann Surg 1954(Sept);140:324-33.

Arthur Hendley Blakemore
(1897-1970)

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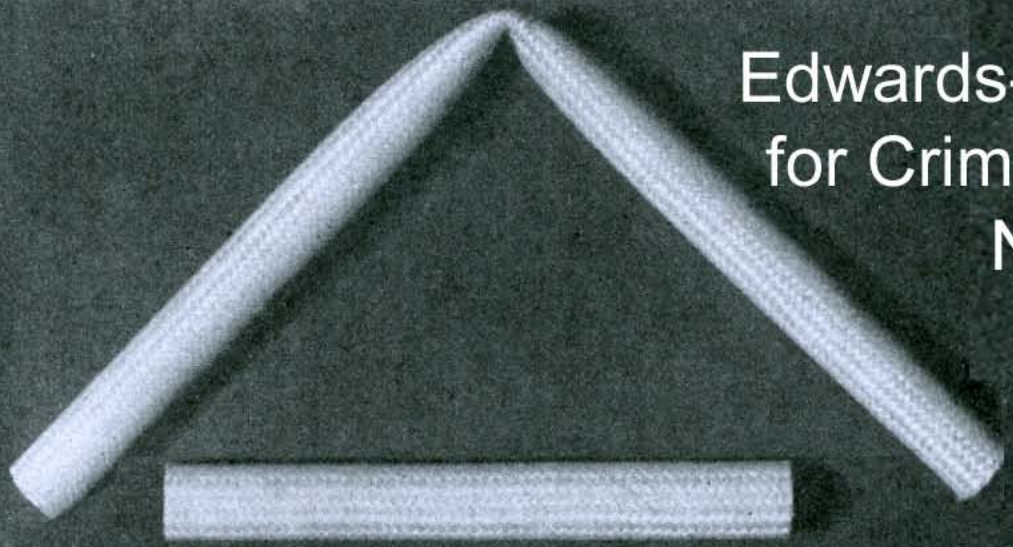
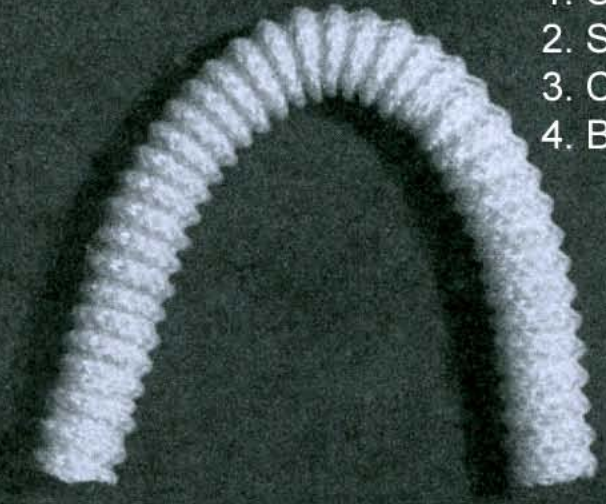
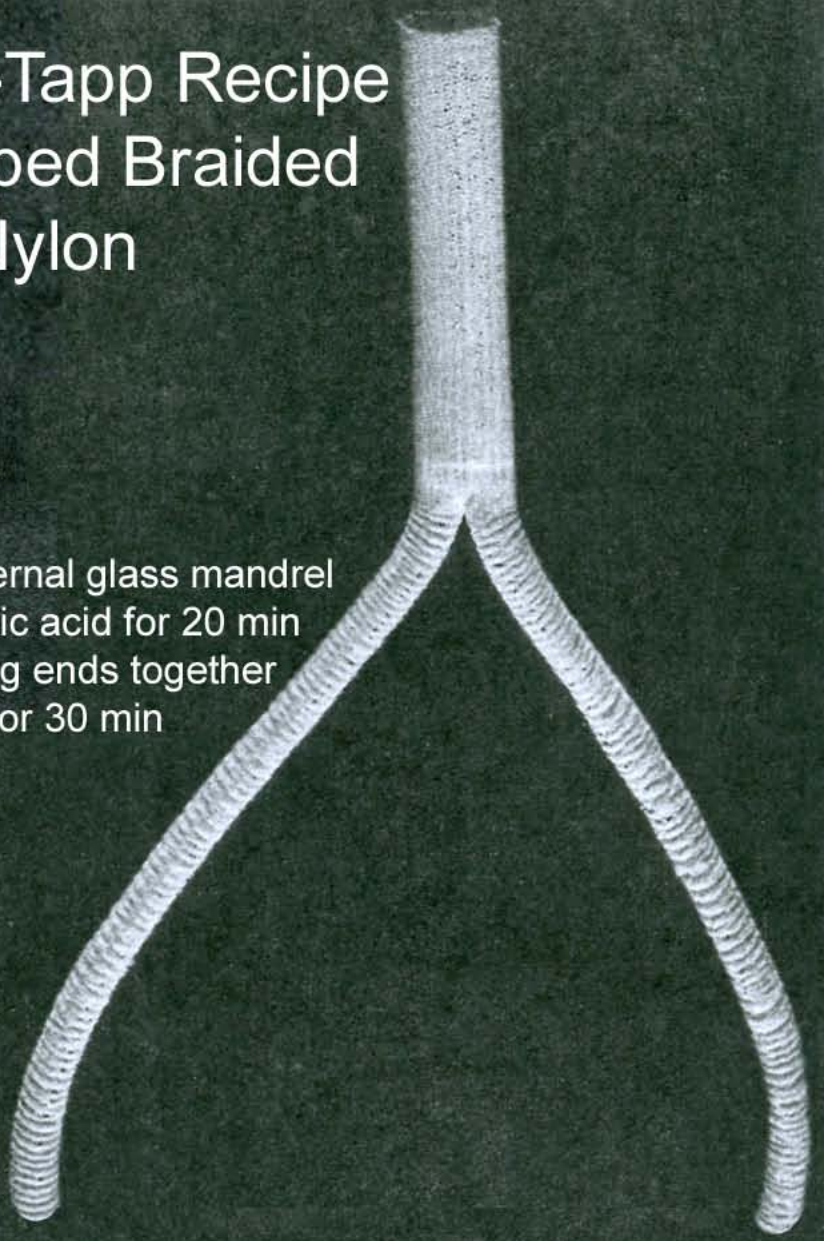
Edwards-Tapp Recipe for Crimped Braided Nylon

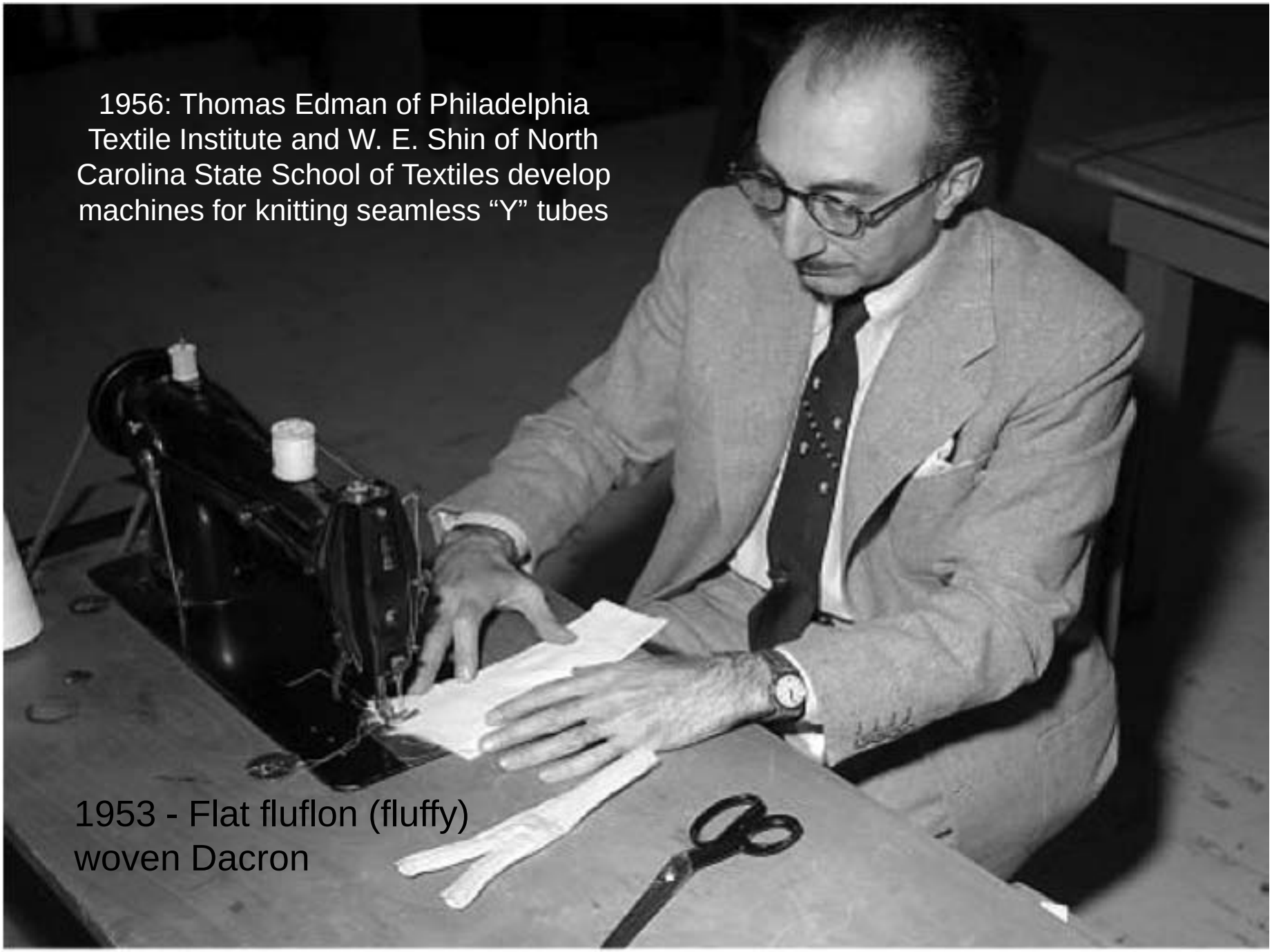


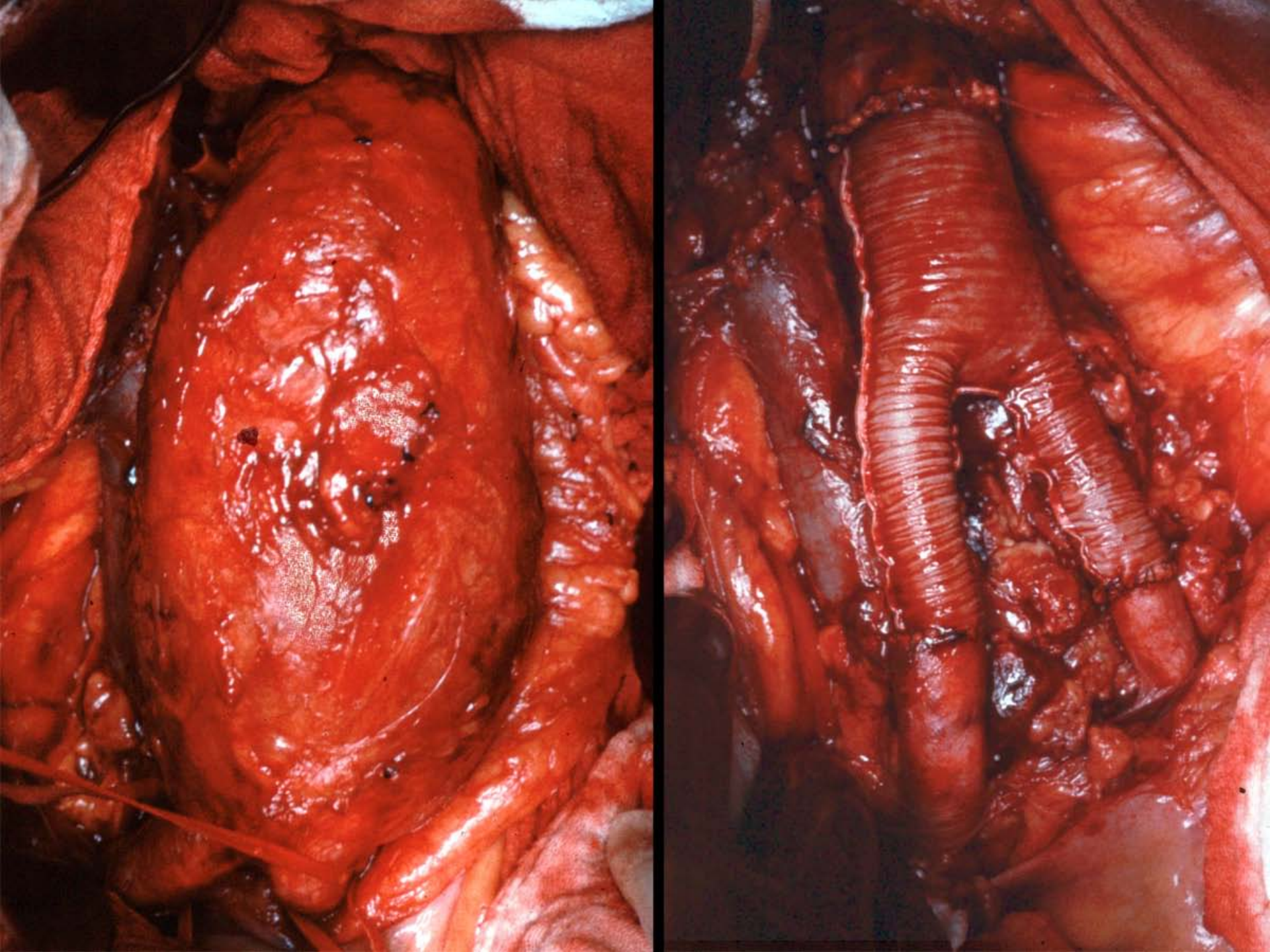


1. Support with internal glass mandrel
2. Soften with formic acid for 20 min
3. Crimp by pushing ends together
4. Bake at 130°C for 30 min

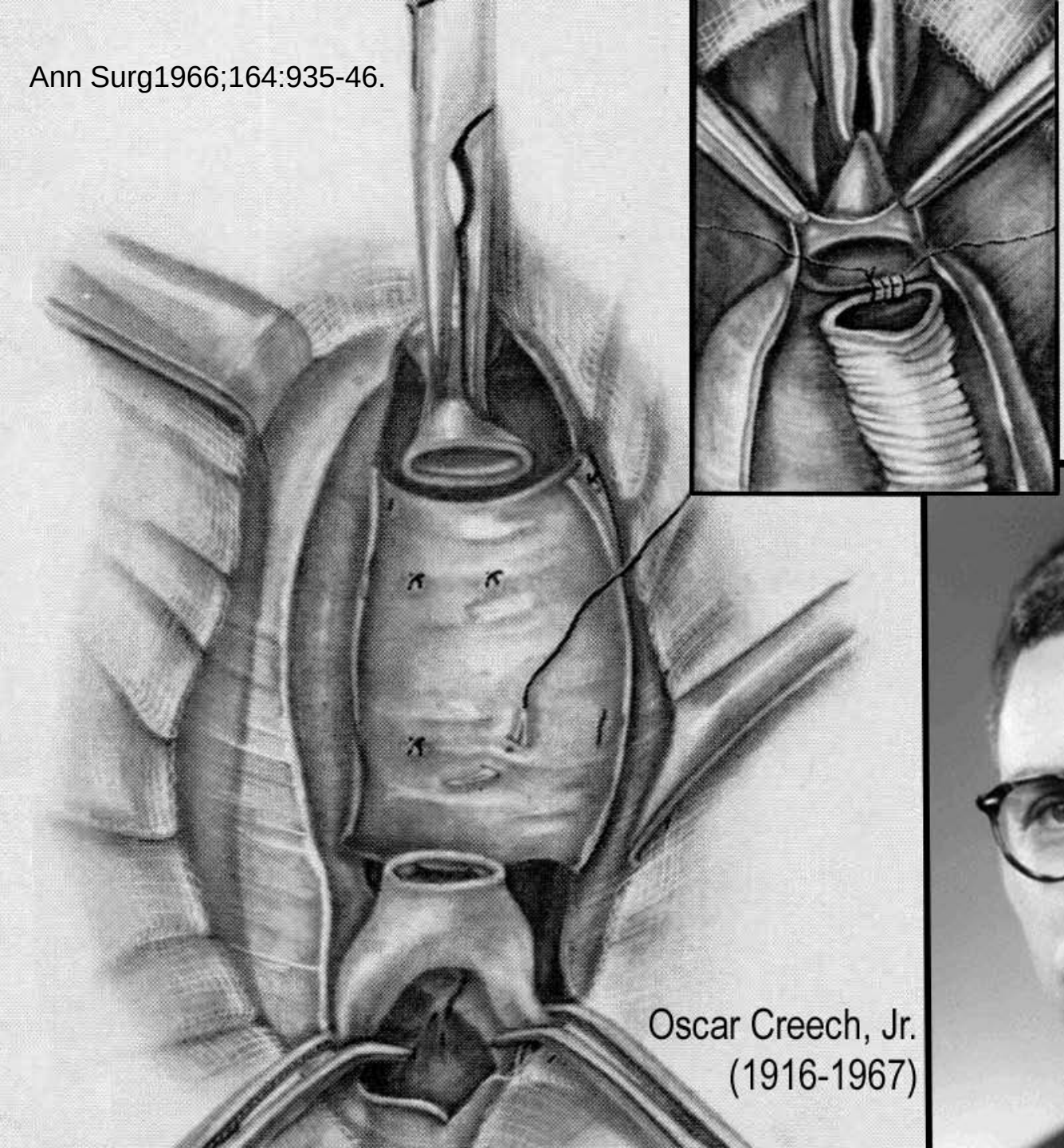


W. Sterling Edwards, Medical College of Alabama & James S. Tapp, JS. Chemistrand Corp, Decatur, AL
Chemically Treated Nylon Tubes as Arterial Grafts. Surgery 1955;38:63-70


1956: Thomas Edman of Philadelphia Textile Institute and W. E. Shin of North Carolina State School of Textiles develop machines for knitting seamless “Y” tubes
1953 - Flat fluflon (fluffy) woven Dacron



Ann Surg1966;164:935-46.



Surgery Chairman 1956-67
Dean 1967

Oscar Creech, Jr.
(1916-1967)

In the fall of 1958, Lowell Edwards asked me to help develop an artifical heart. He was a hydraulic engineer who had patent royalities from things like a stall-proof fuel-injection system for World War II fighter jets that were funding his private engineering lab. I told him it was way too soon for a heart.

"We shook hands and agreed to start with a mitral valve."

“I watched him walk to his car. He was fragile with early Parkinson’s disease, wore crumpled slacks, a sports shirt with no tie, and a tan golfing jacket.”

"I did not realize then that I was taking on another full time Job."

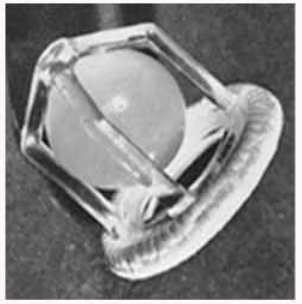
"Edwards would set a grueling pace."

1958

February 1959

"I did not realize then that I was taking on another full time Job."

"Edwards would set a grueling pace."



August 1960

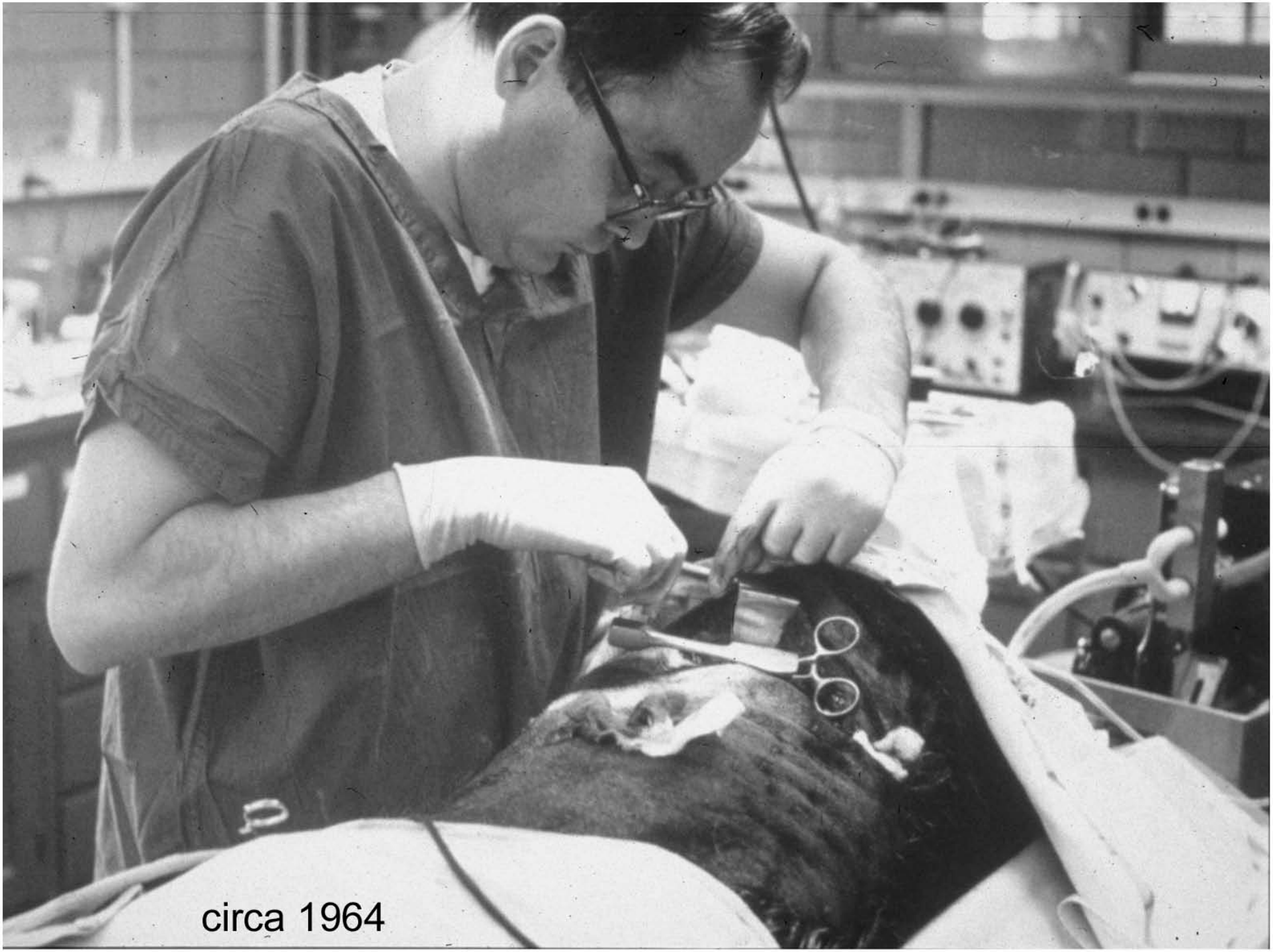
1961-1965

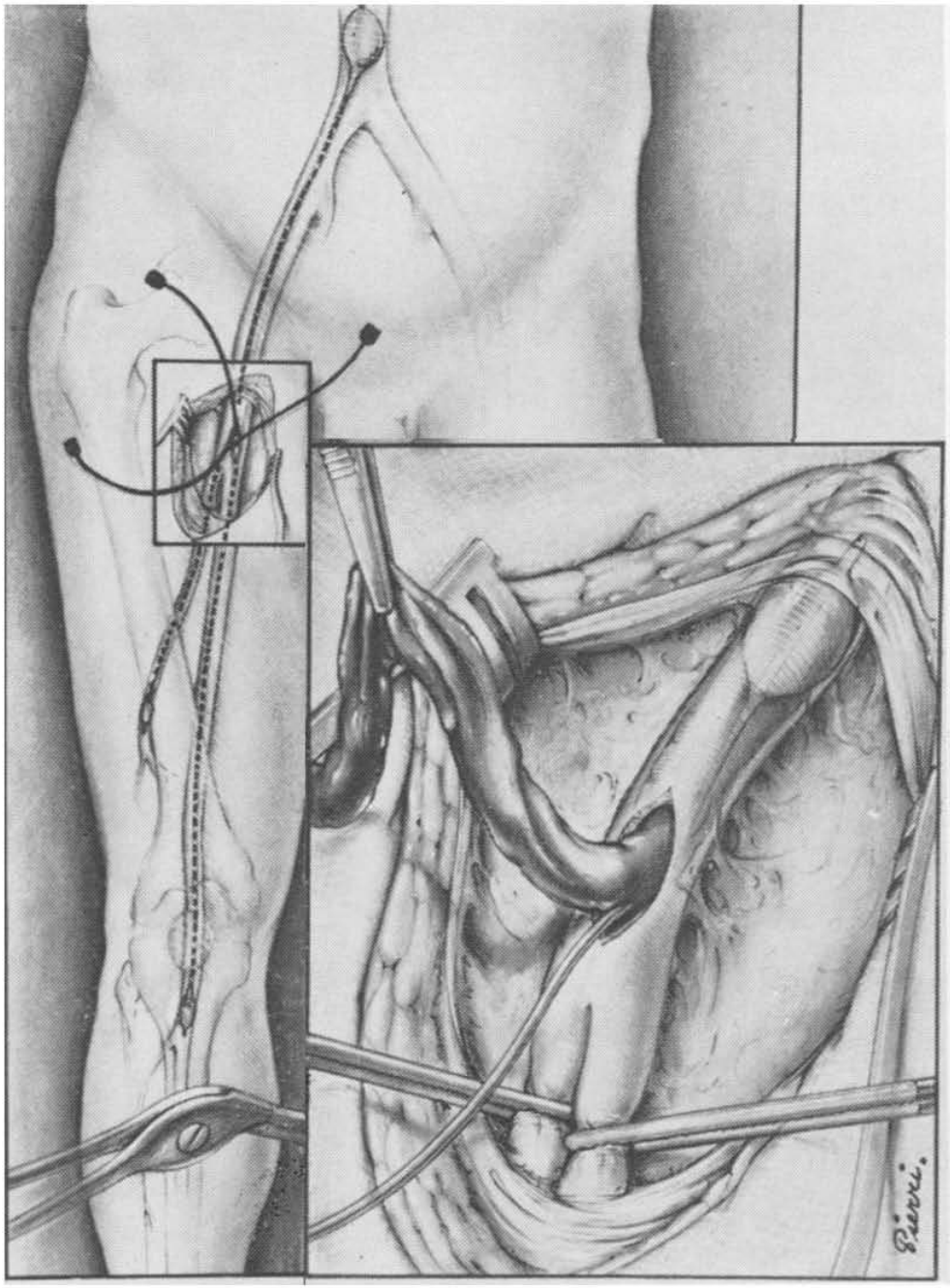
1958

February
1959

1965-present


Jan 30, 1960


circa 1964



ANNALS OF SURGERY

Vol. 161 March 1965 No. 3

Catheter Technic for Arterial Embolectomy *

THOMAS J. FOGARTY, M.D., JOHN J. CRANLEY, M.D.

From the Department of Surgery, University of Oregon Medical School Hospitals and Clinics, Portland, Oregon and the Peripheral Vascular Laboratory, Good Samaritan Hospital, Cincinnati, Ohio

FAILURE of surgical attempts to re-establish the arterial circulation following peripheral arterial embolization was studied in amputated extremities and at autopsy. Inability to extract distally propagated thrombus from atherosclerotic vessels with presently available technics and instruments was common. Failure to recognize at operation that distal clot is not always continuous with the original embolus was responsible for less than complete restoration of the arterial blood supply or for amputation. Based upon these observations, a new instrument for the extraction of arterial emboli was developed. Analysis of 50 patients who were operated upon, continued improvement in the instrument, and associated mortality and morbidity rates are reported.

Clinical Features

The diagnosis of acute arterial insufficiency is easily made. The etiology, however, is not always evident. Difficulty in distinguishing arterial embolism from acute arterial thrombosis was encountered in 15% of cases in this series. Failure to make a definitive diagnosis resulted from absence of any obvious source of the embolus, no apparent heart disease, or slowly progressing signs and symptoms of ischemia. Cases of arterial thrombosis are excluded from this series.

The clinical material represents 56 episodes of embolism occurring in 50 patients treated by a catheter ** technic previously described.[6] The patients were equally divided between the teaching services of the University of Oregon Medical School Hospitals and Clinics and the private vascular service of the Good Samaritan Hospital, Cincinnati, Ohio. The average age of the patients was 69.5 years. Sixty-two per cent were female and 38 per cent male. Table 1 illustrates the number of patients in each ten-year age group. The sites of embolic occlusion are illustrated in Table 2. A prev-

* Submitted for publication February 3, 1964. Supported in part by a grant from the Oregon Heart Association.

** Obtained from Edwards Laboratories, Incorporated, Santa Ana, California.

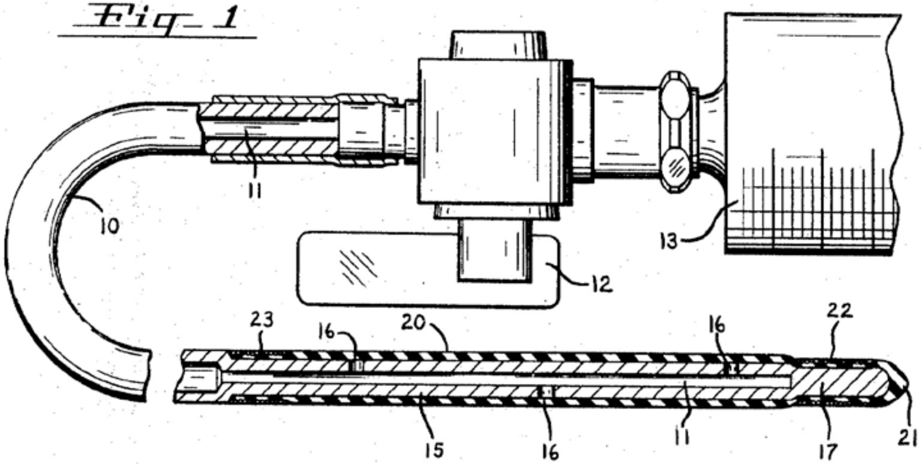
April 1, 1969 3,435,826

T. J. Fogarty

Embolectomy Catheter

Filed May 27, 1964

Fig. 1



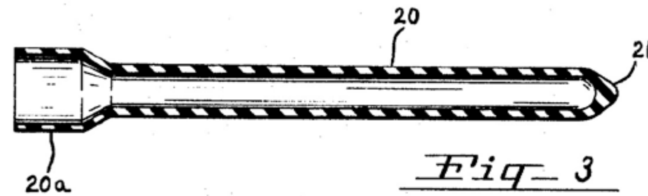


Fig. 3

Fig. 3

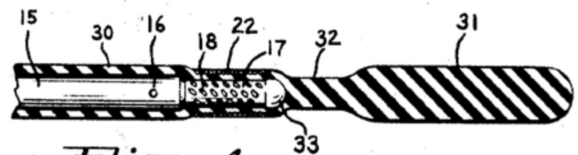
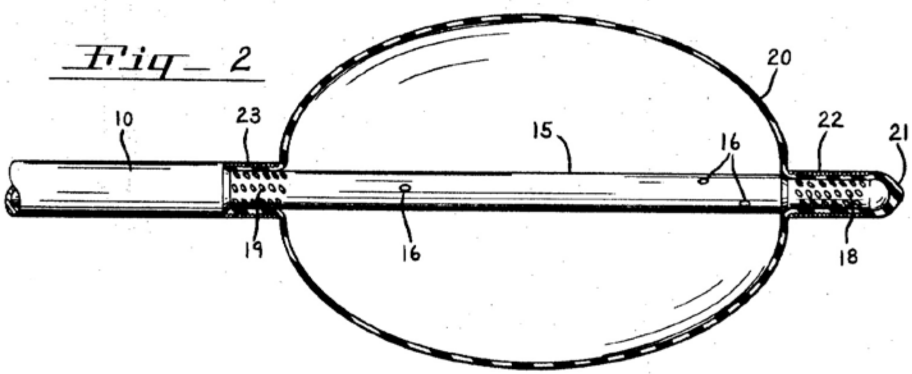


Fig. 4

Fig. 2



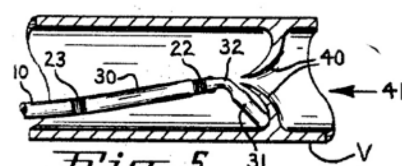
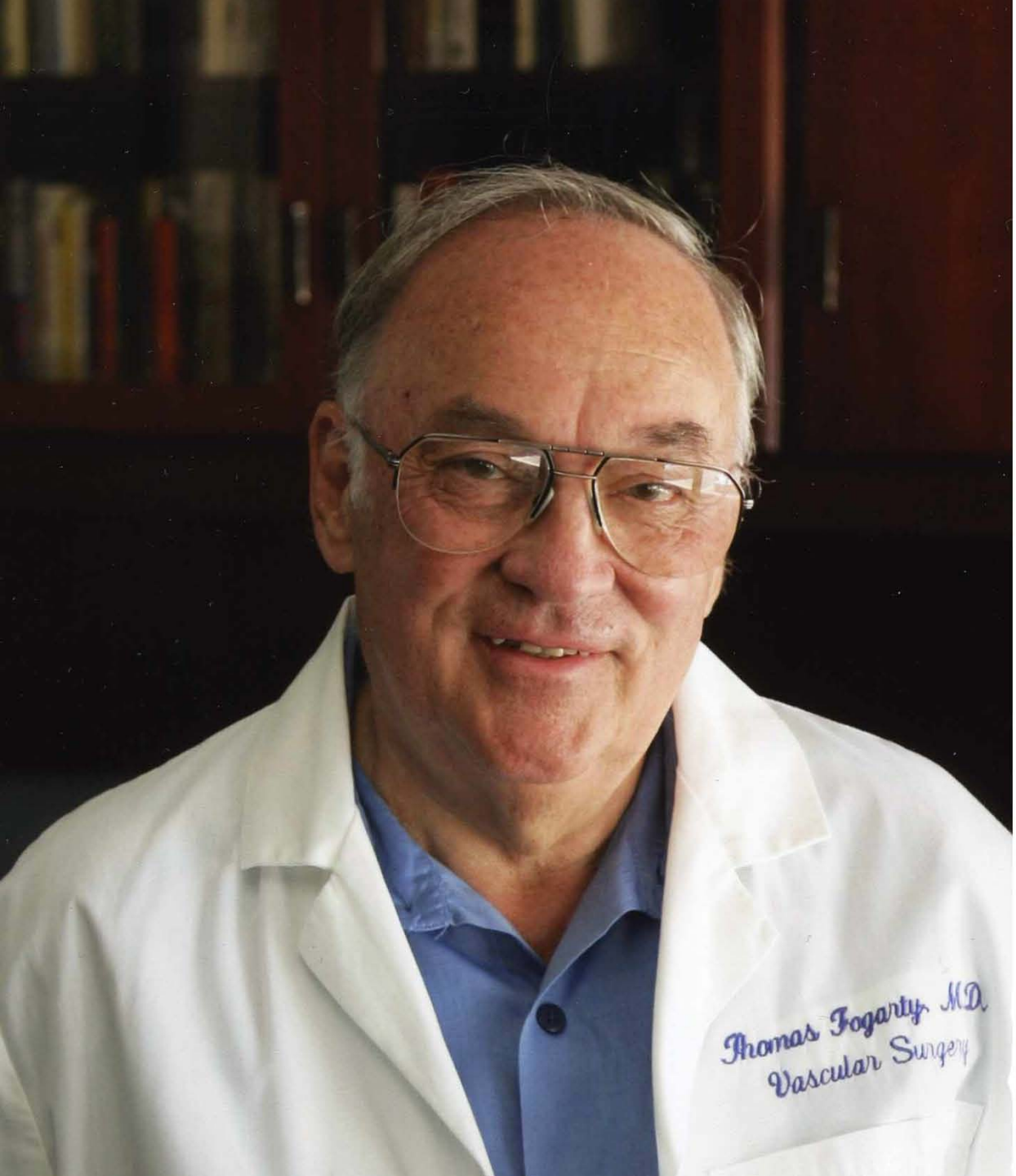


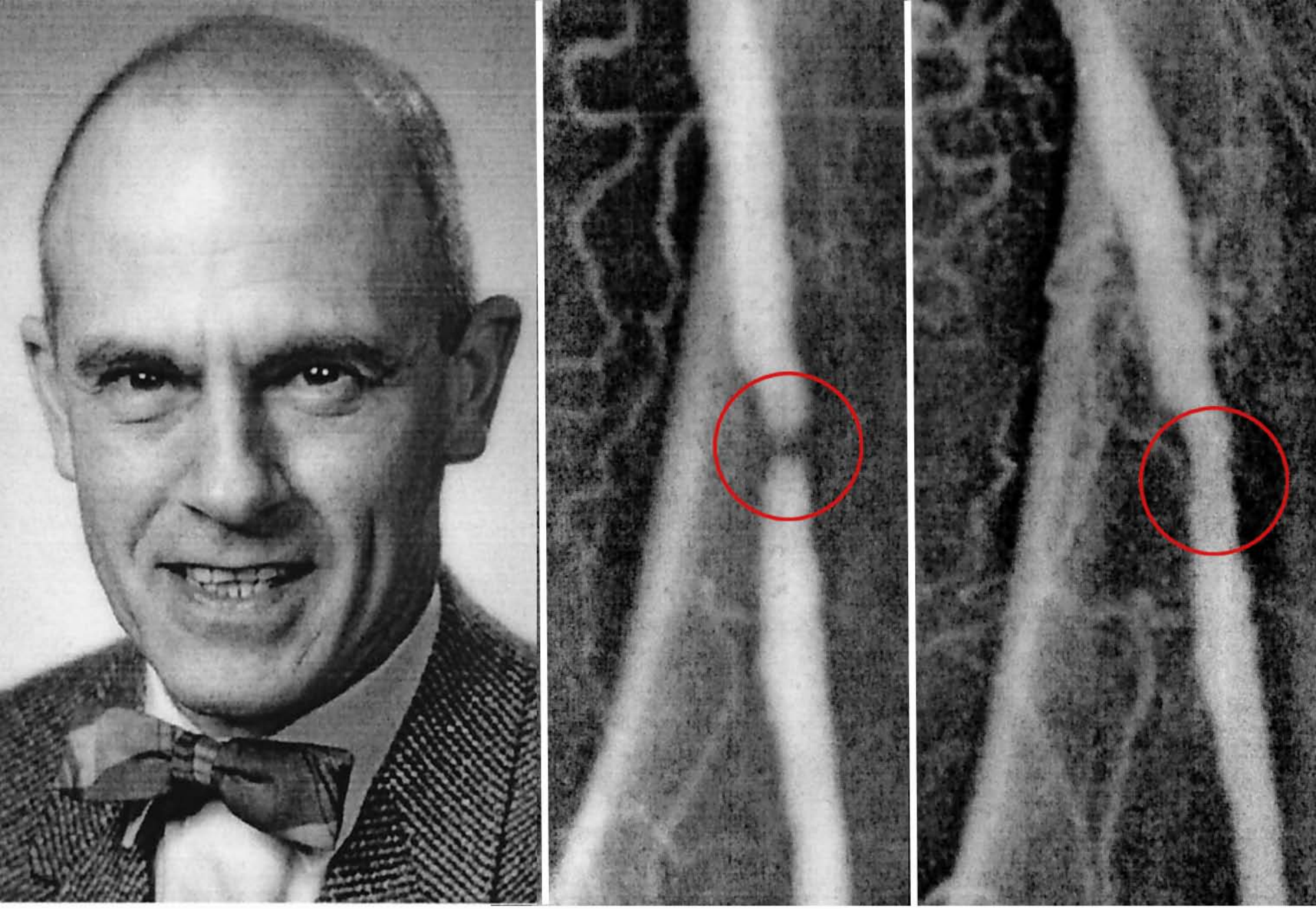
Fig. 5

INVENTOR.
THOMAS J. FOGARTY
BY
Attorney

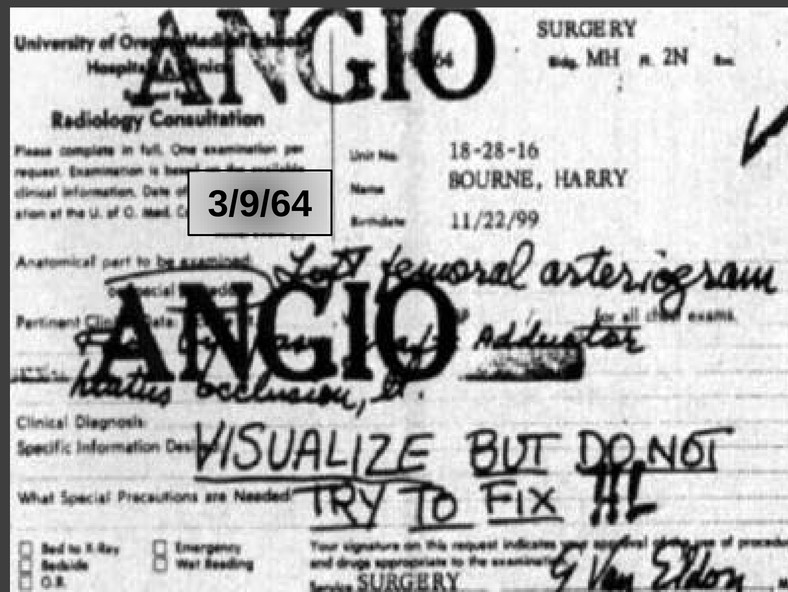

Thomas Fogarty, M.D.
Vascular Surgery


BALLOON
INFUSION
BALLOON
ASPIRATION
Thomas Fogarty
CHARDONNAY
Thomas Fogarty
PINOT NOIR

Trellis



Charles Dotter (1920-1985) and the world's first transluminal angioplasty performed on January 16, 1964 on an 82 year old lady with a tight SFA stenosis & gangrenous toes who walked out of the hospital on both feet.


ANGIO

University of Oregon Medical School Hospitals & Clinics

Radiology Consultation

SURGERY

Bldg. MH Fl. 2N Rm.

Please complete in full. One examination per request. Examination is based on the available clinical information. Date of ... ation at the U. of O. Med. C...

Unit No. 18-28-16

Name BOURNE, HARRY

Birthdate 11/22/99

3/9/64

Anatomical part to be examined: Left femoral arteriogram

ANGIO

Pertinent Clinical Data: ... for all chest exams

... Adductor

... occlusion, ...

Clinical Diagnosis:

Specific Information Desired: VISUALIZE BUT DO NOT

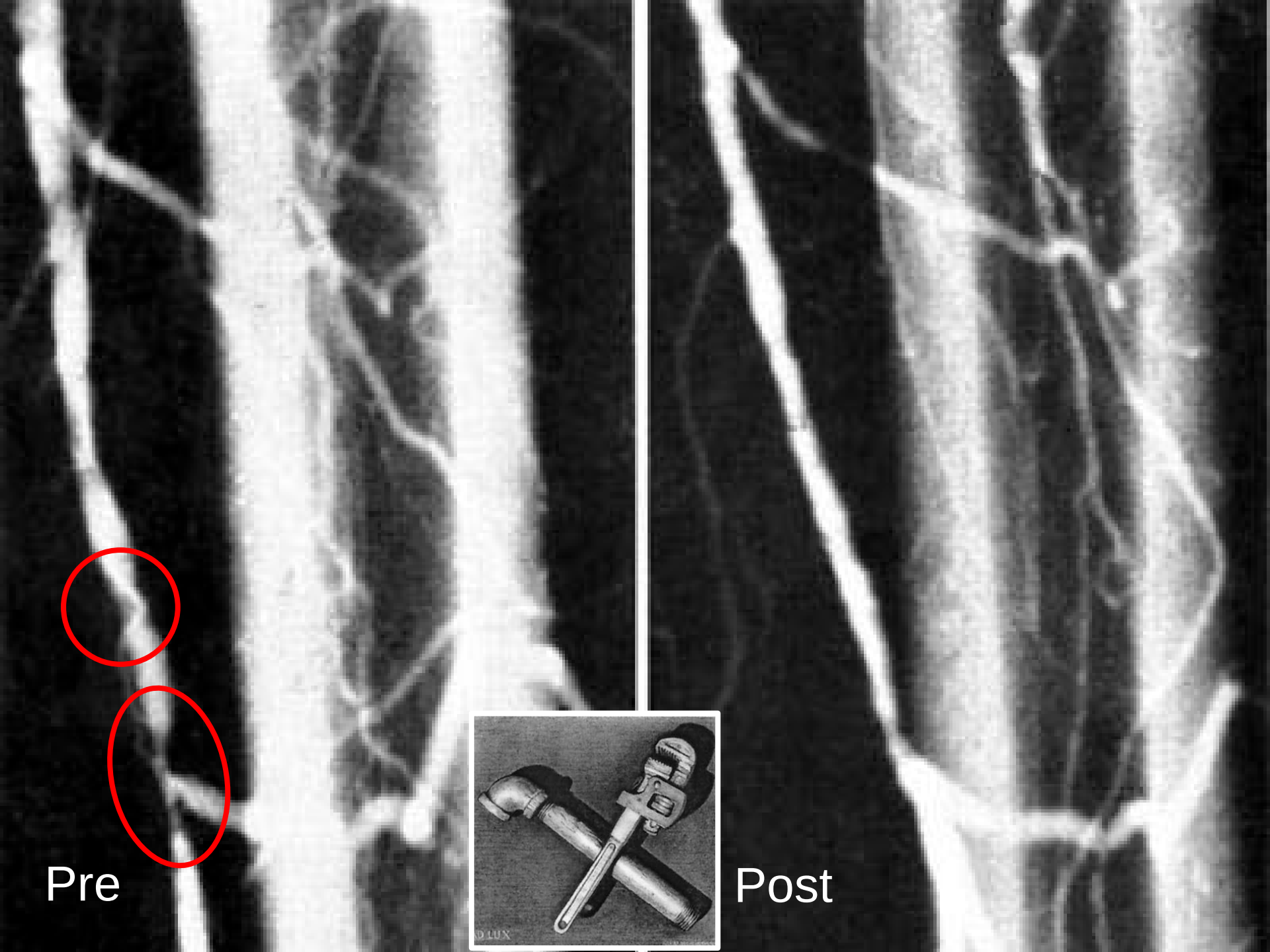
What Special Precautions are Needed: TRY TO FIX !!!

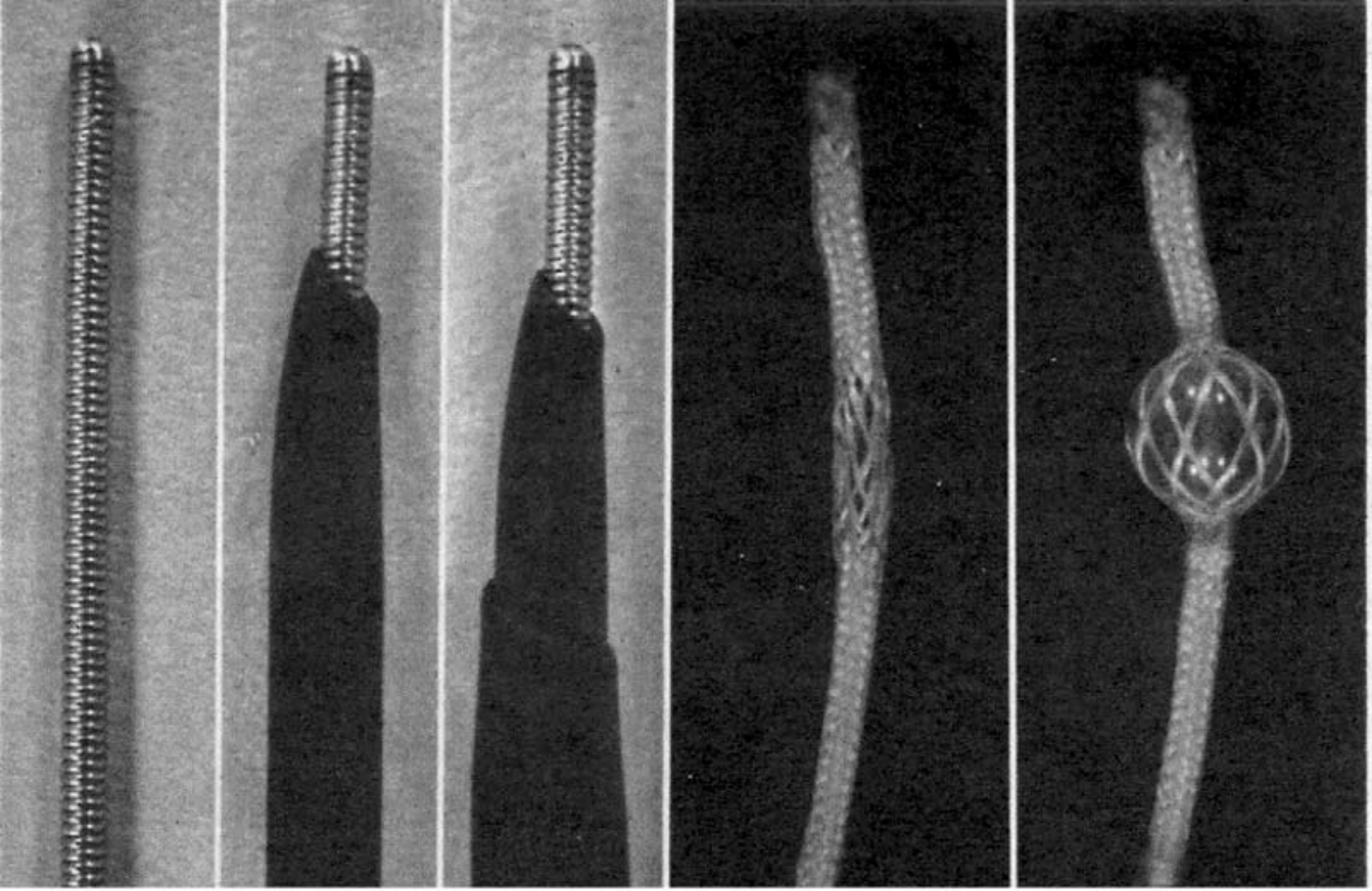
☐ Bed to X-Ray ☐ Emergency
☐ Bedside ☐ Wet Reading
☐ O.R.

Your signature on this request indicates your approval of the use of procedures and drugs appropriate to the examination.

Service SURGERY

G Van Eldon M.D.


Pre
Post



Spring guide wire and coaxial dilators

1966

Reinforced balloon dilating catheter


Vail 7,908 ft, 2,410m
1971


Kilimanjaro 19,340ft, 5,898m
north-eastern Tanzania


HEINZ
TOMATO
KETCHUP
57

Laboratory Residents & Fellows: Next week, the W.L. Gore Co. will be sending us tubes & sheets of expanded PTFE in various pore sizes and thicknesses. Please advise your interest in one of these projects by Wed -

1. Evaluate for membrane oxygenator use: relate pore size and surface area to O_2 transfer rates, tubes vs. sheets, static charge, & bubble potential.
2. Artery substitutes: Large (6-8mm), small (2-4mm), neointima formation.
3. SVC, IVC, & 4-6mm veins: as tubes and patch grafts
4. Portal vein replacement
5. Tracheal and bronchial segment replacement
6. Bile duct stricture repair
7. Use as a burn dressing: pore size & compatibility with topical antibiotics

BE

Laboratory Residents & Fellows: Next week, the W.L. Gore Co. will be sending us tubes & sheets of expanded PTFE in various pore sizes and thicknesses. Please advise your interest in one of these projects by Wed - **the others will be assigned on Thur.**

1. Evaluate for membrane oxygenator use: relate pore size and surface area to O_2 transfer rates, tubes vs. sheets, static charge, & bubble potential.
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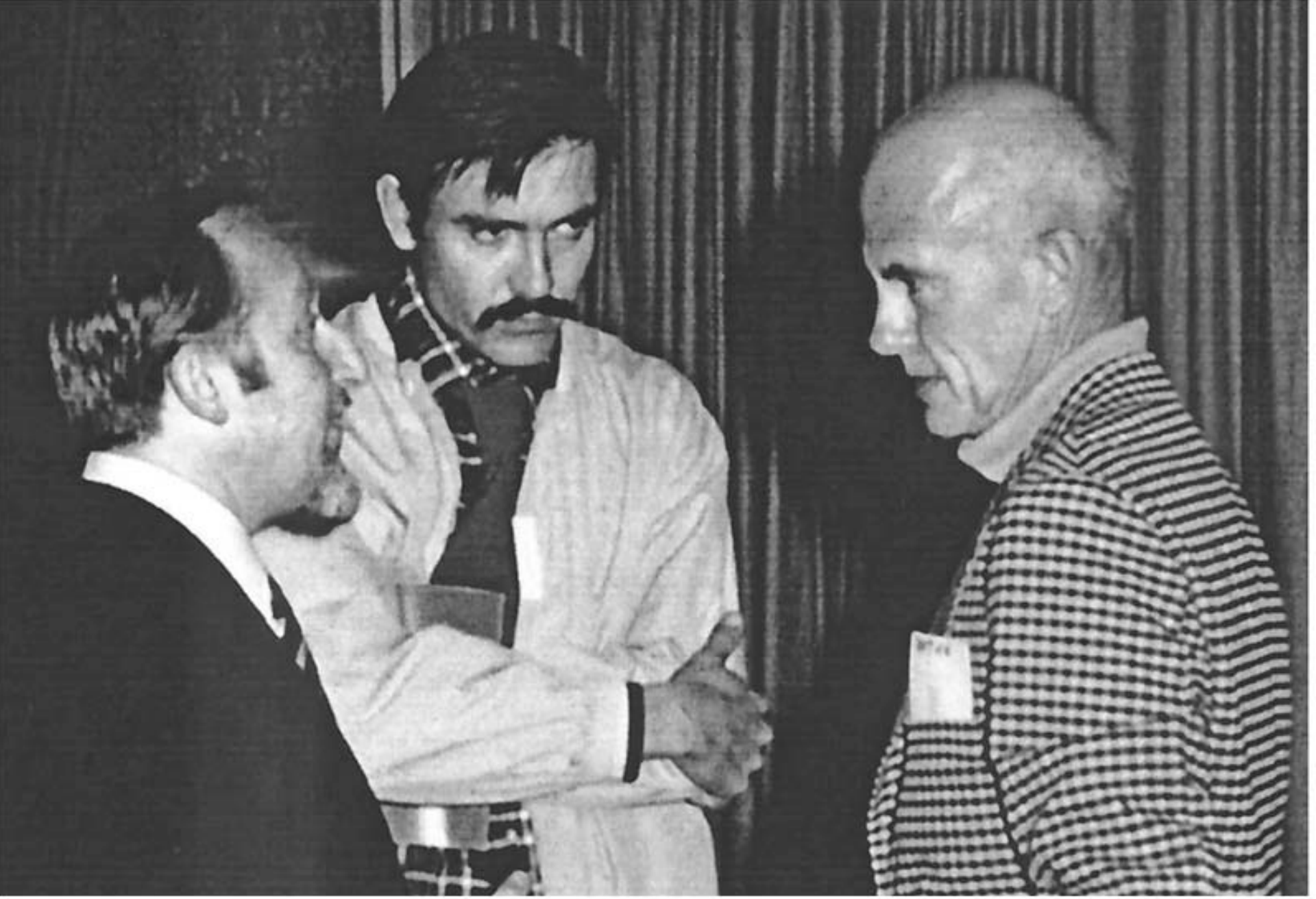
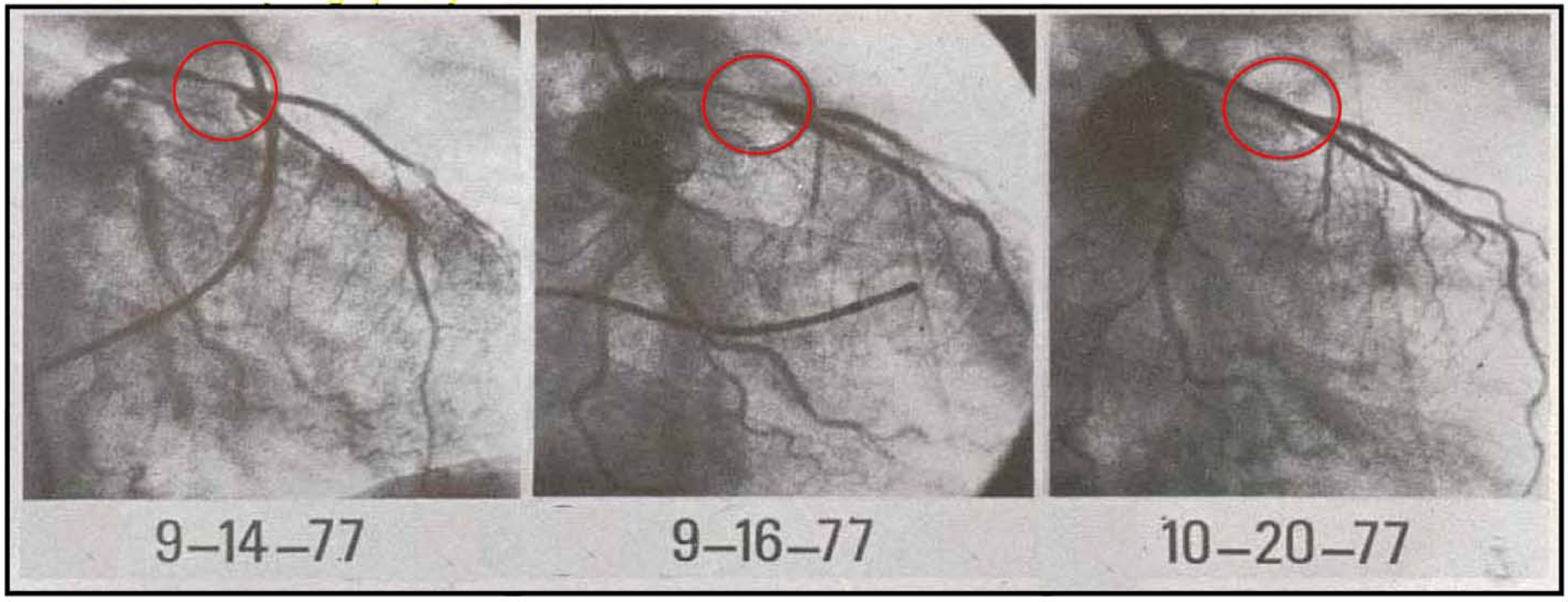
BE



Eberhart Zeitler, Andreas Grüntzig, & Charles Dotter in 1975

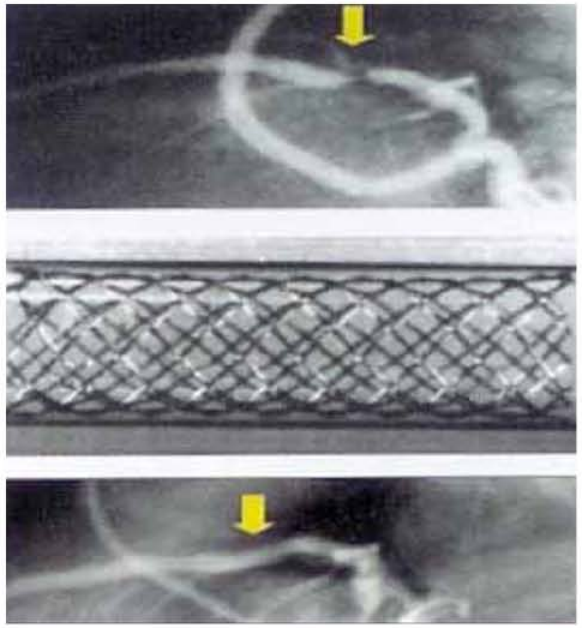


First Percutaneous Coronary Angioplasty
September 16, 1977, Zurich

Andreas Grüntzig
Jun 25, 1939-Oct 27, 1985

Julio Palmaz' **1985** stainless steel ballon expandable stents

Cesare Gianturco's **1985** self expanding "Z" stent



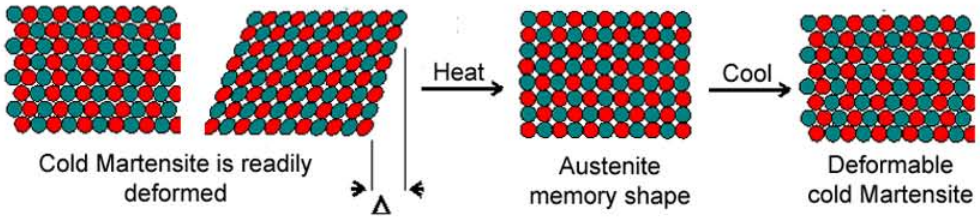
First clinical use of a coronary artery stent, Puel-Sigwart 1986

Nitinol Self Expanding Stents

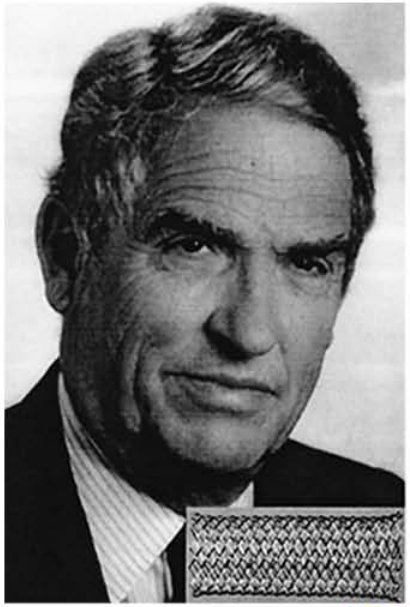
The US Naval Ordinance Laboratory (NOL) discovered the Shape Memory Alloy properties of a 55% Nickel, 45%Titanium alloy during a 1962 search for a new corrosive resistant metal.

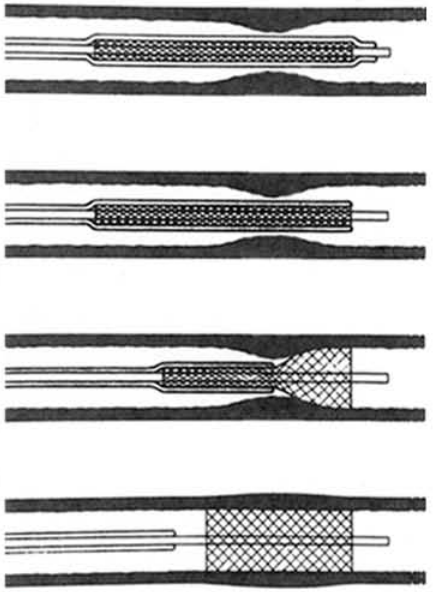
"Nitinol" reflects its element content Ni, Ti, and the Naval Ord Lab.

The precise ratio of Nitinol's elements determines its transition point: A 1% change varies the transition point from -100 to + 100 ℃.



The returning-to-austinite yield strength is >35,000 psi.

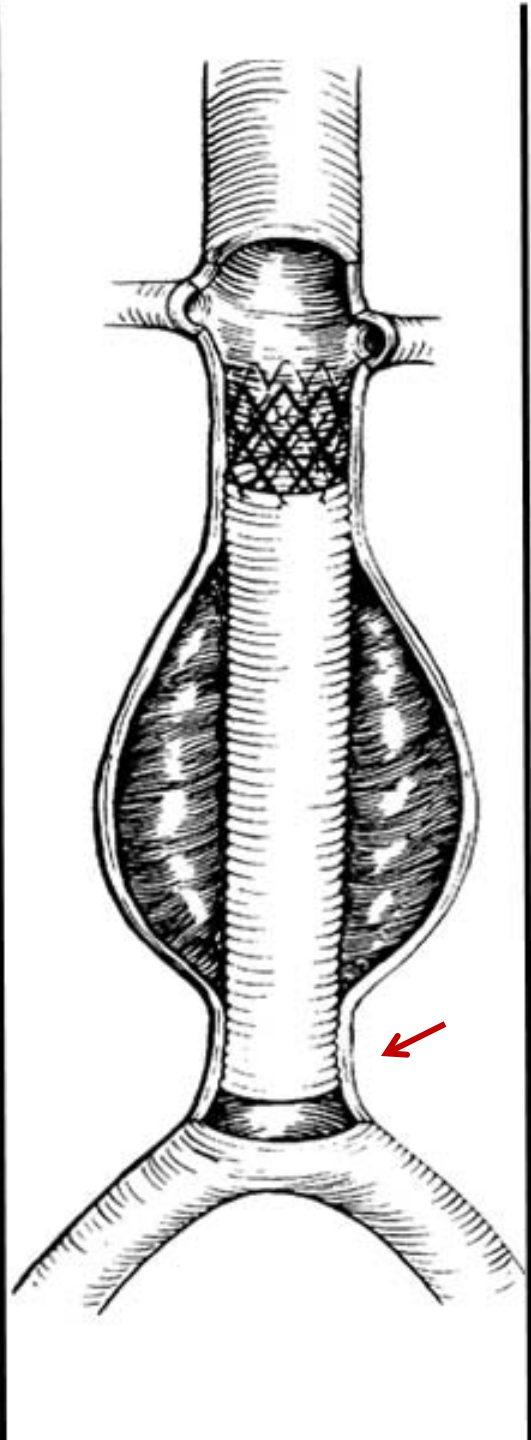




Hans Wallstent's **1985** self expanding stent

Balko A. et al. Transfemoral placement of intraluminal poly-urethane prosthesis for abdominal aortic aneurysm. JSR1986;40:305-9


6 cm
Sept 6, 1990




Oct 29, 1990

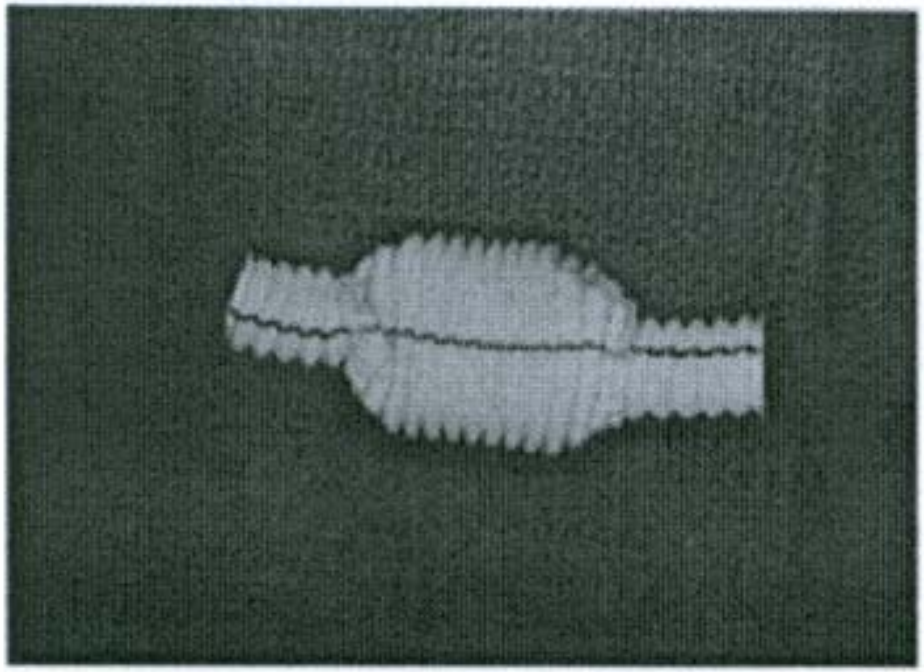
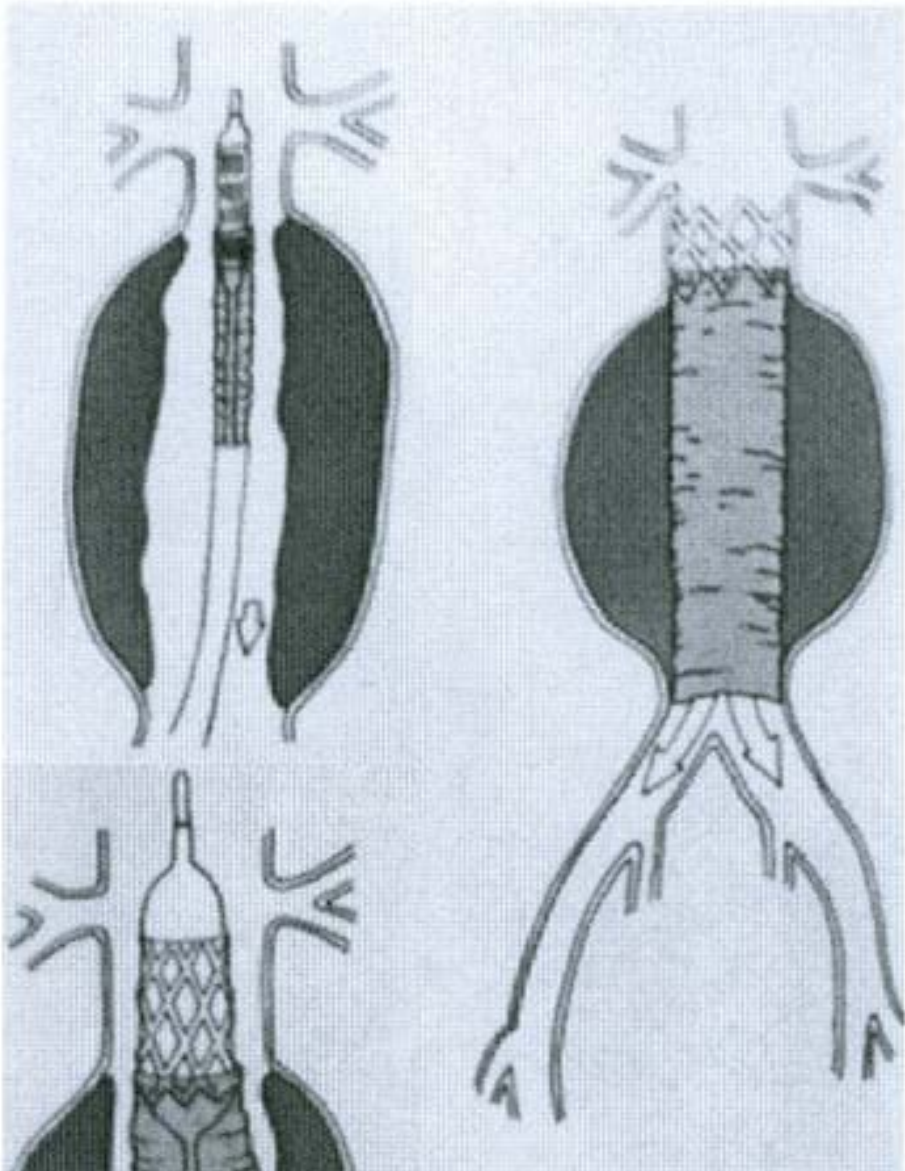


Fig. 1. Artificial abdominal aortic aneurysm created by fusiform-shaped Dacron conduit.

population [1 of study, the
incidence of A reefold. Fur-
thermore, ane populations
such as first-o with AAA or
patients in ca hown that in
select populat curysms may
vary from 5%



Commentary to Parodi's 1991 Publication*

In vascular surgery, no change for the better has occurred that wise and good men have not opposed.

John J. Bergan

2004 Interview for *Endovascular Today*

The President of Argentina called asking me to take care of his friend who had an aneurysm with back pain and was too sick to have an operation. I explained to the President and the patient that we had only done endografts in dogs.

I asked Julio Palmaz to come from San Antonio to help me.

The procedure went amazing well, but the proximal fixation had to be re-enforced with a second stent. His aneurysm diminished despite the lack of distal fixation and he lived for 9 more years to die of pancreatic cancer.

---

*Parodi JC, Palmaz JC, Barone HD. Transfemoral intraluminal graft implantation for abdominal aortic aneurysms. Ann Vasc Surg 1991;5:491-9.

Special Thanks are due To:

Jerry Rainer
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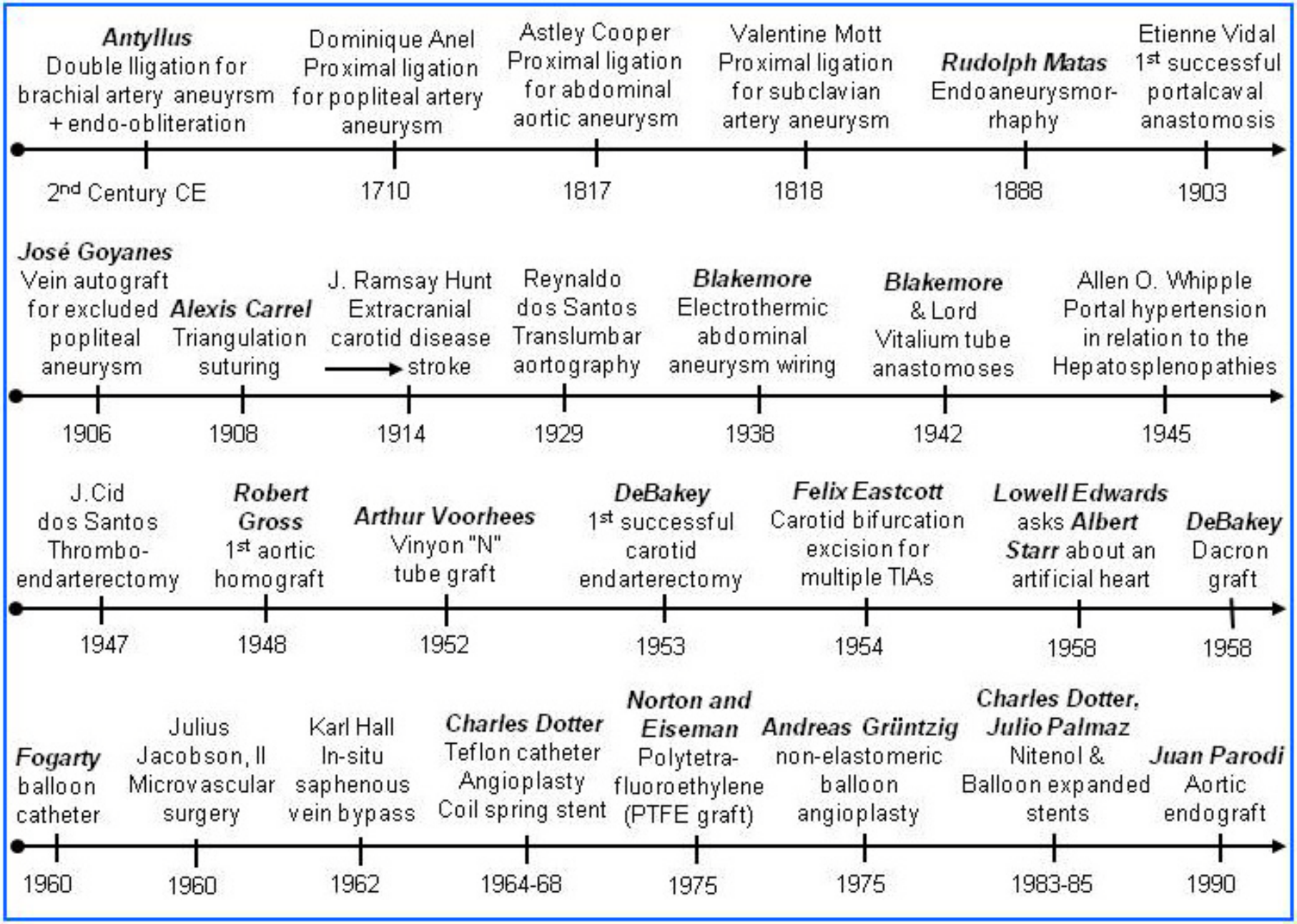
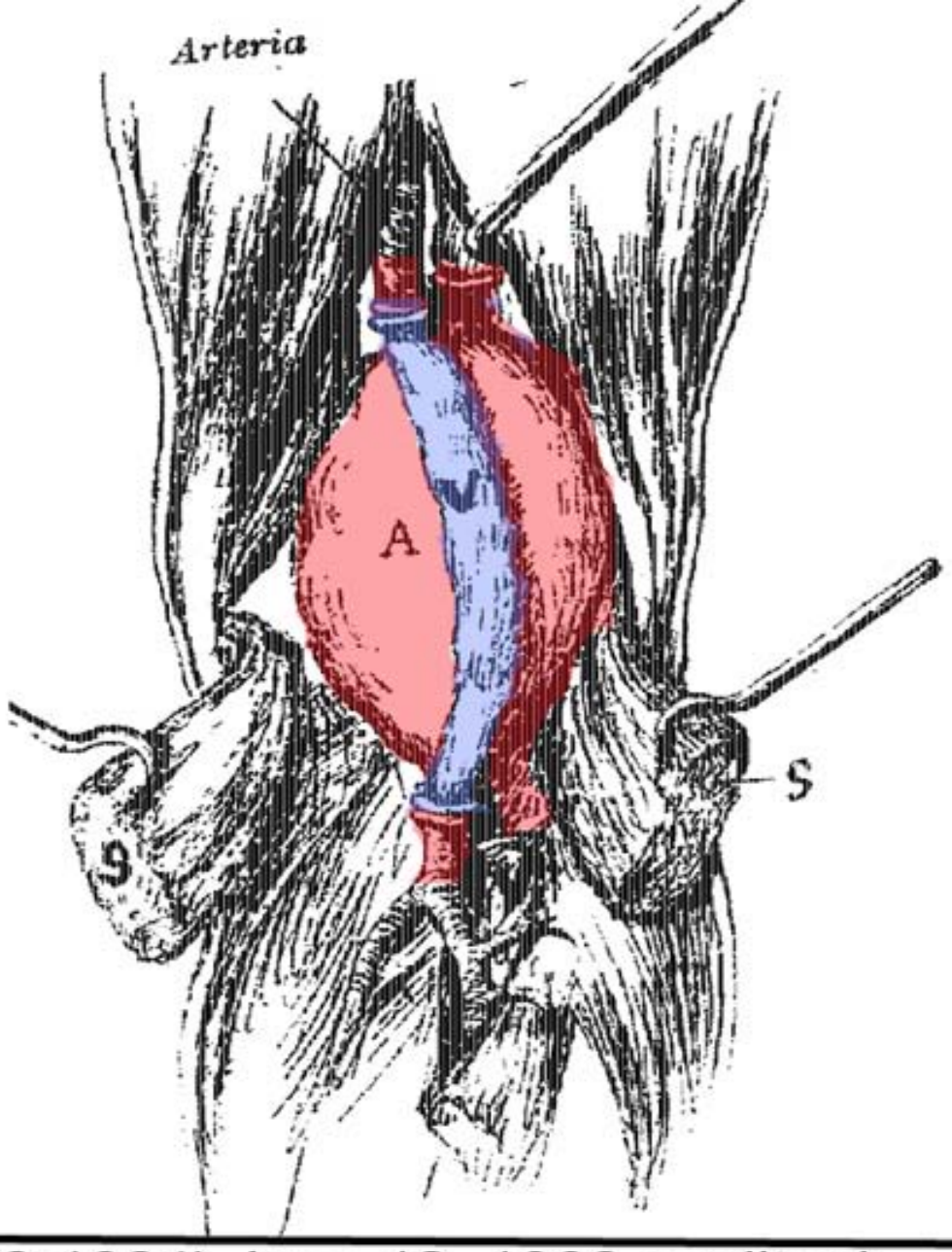
Al Starr
Bill Pearce
Andy Eiseman
Dave Rosenthal
Larry Norton
Everett Spies

Olivier Pichot
Sally Hanley
Jack Connolly
Bob Smith
Jack Jacobson
Wes Moore
Max Wohlauer
Ken Cherry
Dave Wieting
Tom Fogarty
John Bergan
Jane Scribner

The Evolution of Vascular Surgery

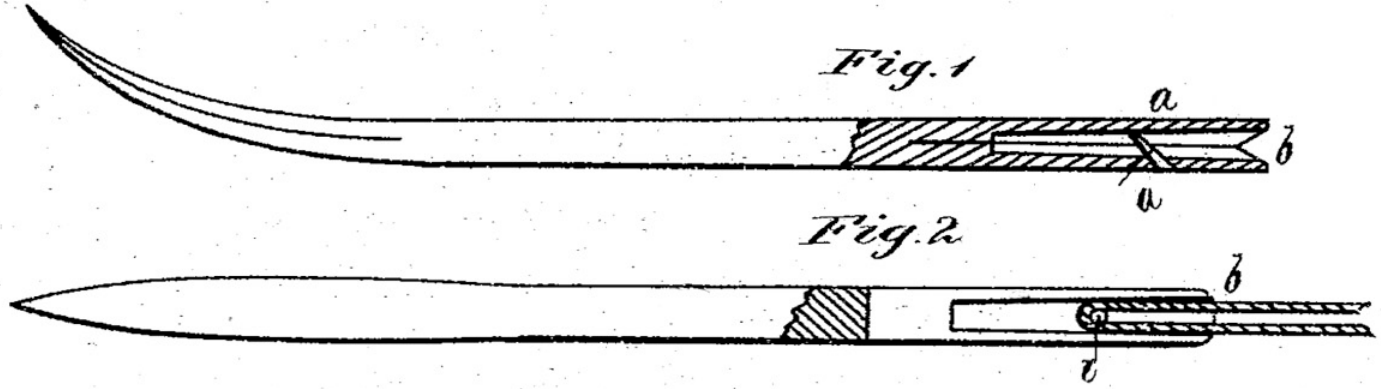


Arthur B. Voorhees, Jr. & Robert B. Smith, III at Hot Springs, VA, in December1978



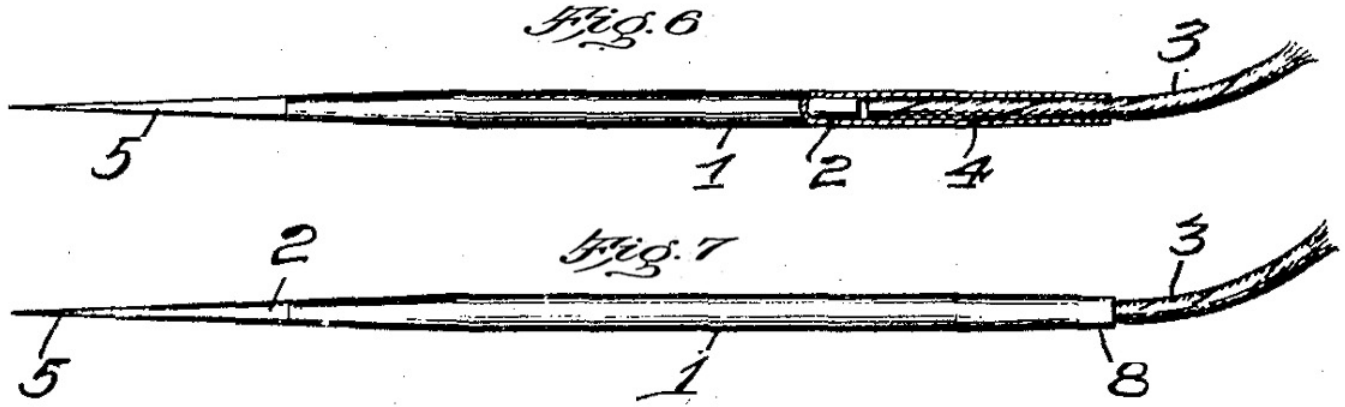
Jose' Goyanes Capdevila (1876-1964) June 12, 1906 popliteal aneurysm exclusion with adjacent popliteal vein bypass.

Arthur B. Voorhees, Jr. & Robert B. Smith, III at Hot Springs, VA, in December1978



Patent No. 156795 **Filed** Oct 3, 1874 **Issued** Nov 10, 1874 to Henry M. Jenkins of New York, NY

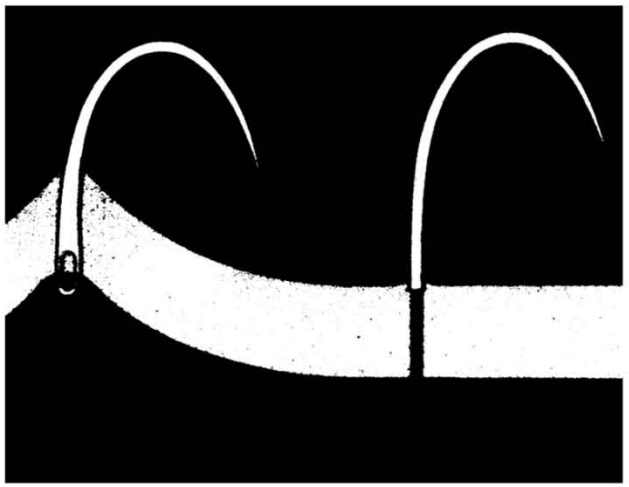
The head of this self-threading surgical needle is split forming two hollowed out jaws with beveled ends to form a notch Fig 1b. A downwardly inclined pin projects from one jaw, extending nearly across the gap (aa). The thread is passed into the notch (b) past the pin (i) and and withdrawn so that it lies in the hollowed out jaws as shown in Fig 2.

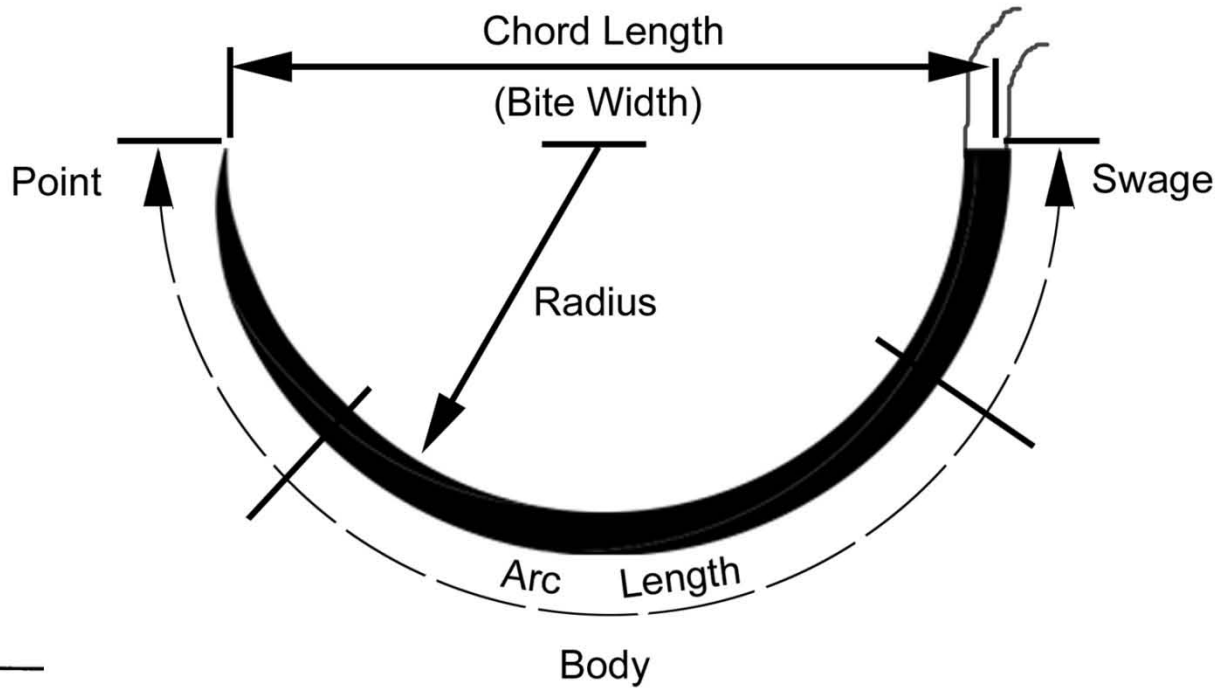


Patent No. 15901021 **Filed** Sept 27, 1924 **Issued** July 6, 1926 to Charles T. Davis, assignor to Davis & Geck Inc., Brooklyn, NY.

This invention is an improvement in needles, and with respect to its more specific features, an atraumatic needle designed for surgeons' use.

Davis shot and killed a police officer on Feb 17, 1921 who had come to his office thinking the officer was an agent of Kaiser Wilhelm coming to assassinate him. He was confined in a mental institution at the time of filing and imprisoned for murder at the time of its issue.

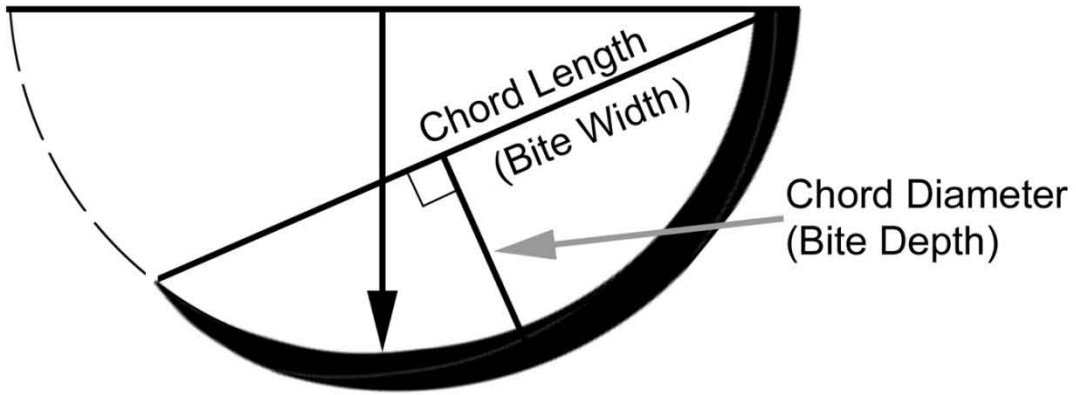




MINIMAL TRAUMA

ETHICON swaged needle draws a single strand suture through tissue easily. No dull or broken needles, no frayed or torn sutures and no large eye or double strand to pull through friable tissue.

ETHICON Ltd. 1974



Sept 16,1935

June 13,1938

Kidney

Rubber band

Aneurysm filled with wire

A

Vinyon N cloth

Retro-peritoneal area

B

Celiac axis

C

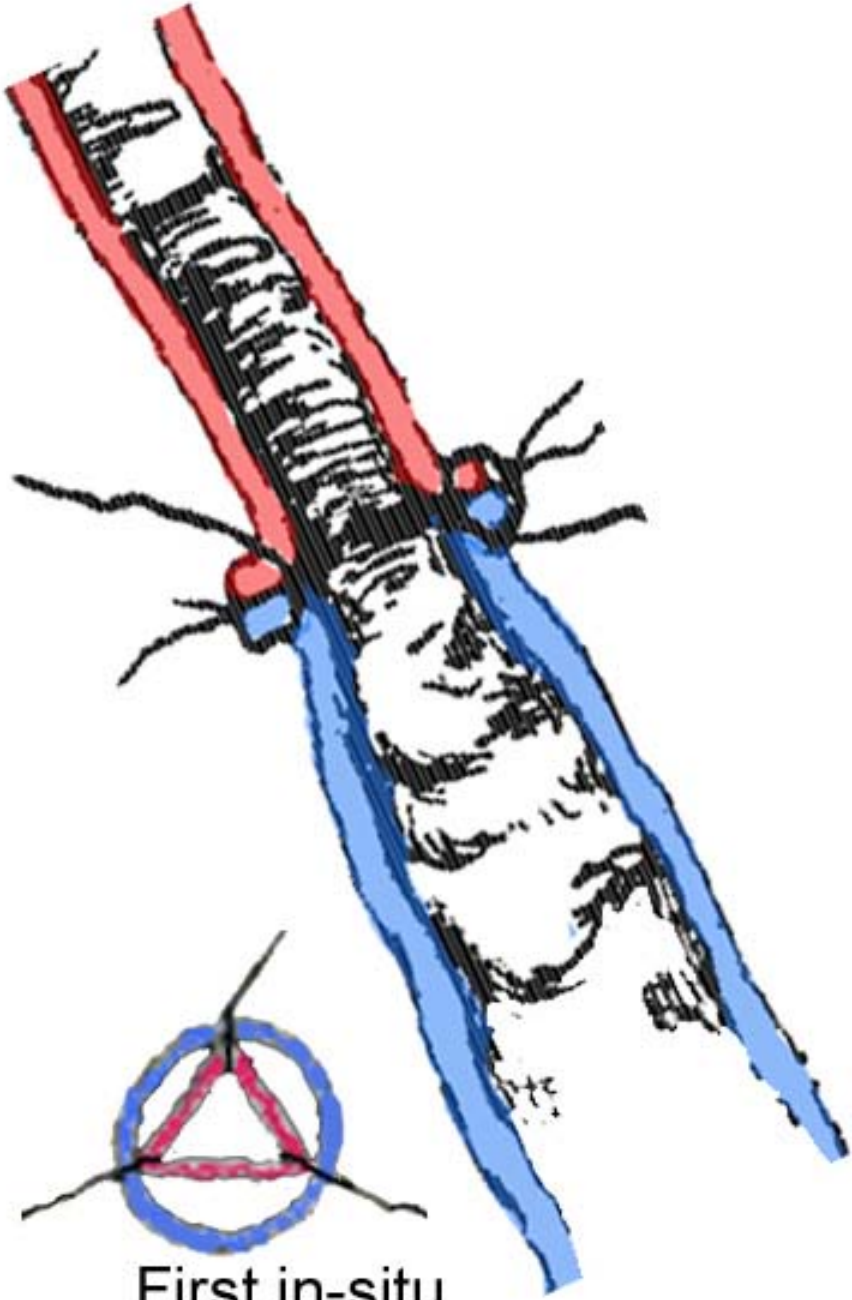
Rubber band

Vinyon N cuff

Aorta

D

Goyanes J. Substitucion plastica de las arterias por las venas o arterioplastia venosa aplicada, como nuevo metodo, al tratamiento de los aneurismas. Siglo Med 1906 Sept;2752:561-4.



First in-situ
non-reversed vein graft