A brief History of AAA Repair & Surgery

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Grafts

- Ligation
- Anastomosis
- Wrapping
Development of ligation method

- Ligation Method
  - Early Ligation (2\textsuperscript{nd} Century AD)
  - Modern Ligation (1923 Matas)
Early Ligation

Antyllus

In the 2nd Century AD Antyllus performed the first recorded surgical intervention for the treatment of AAA – proximal and distal ligation of the aorta with central incision of aneurysmal sac to remove the thrombotic material.

In 1817, Cooper ligated the aortic bifurcation in a ruptured iliac aneurysm, the patient died four hours later\textsuperscript{1*}.

In 1923, Matas performed the first successful complete ligation of aorta with cotton tapes for aneurysm. Matas´ s Patient survived for 17 months and died later of tuberculosis\textsuperscript{2*}.

\textsuperscript{1*}Steven G. Friedman, History of vascular surgery, second edition, chapter 7, P74
\textsuperscript{2*} Steven G. Friedman, History of vascular surgery, second edition, chapter 7, P77
Matas’s contribution to AAA surgery

endoaneureysmorrhaphy*

technique was developed by him, which involved ligation the aneurysmal sac upon itself to restore normal luminal flow.

*Steven G. Friedman, History of vascular surgery, second edition, chapter 10, Rudolph Matas, P115
Wrapping and promoting thrombosis

- **AAA wrapping with Cellophane**: to induce fibrosis and eliminate aneurysm growth, it was investigated by Pears in 1940, and Harrison in 1943.

- **Promoting thrombosis**: by introducing foreign material into the aneurysmal lumen to promote thrombosis, in 1831, Velpeau tried with sewing needles, later Moore–Corradi method was performed by passing electric current through a wire inside the aneurysmal lumen, both attempts were unsuccessful.


Albert Einstein and AAA

- In 1943, Albert Einstein was operated by Nissen.
- Using the wrapping method with cellophane.

The aneurysm finally ruptured in 1955.

Anastomosis method

- In 1944 Crafoord: he resected of Coarctation of aortic lesion and reanastomosed the aorta by end-to-end anastomosis using the triangulation technique of Carrel with restoration of arterial continuity\(^1\).
- In 1947, Shumacker performed the same procedures to attempt the first successful thoracic aneurysm, he resected a 4 cm thoracic aortic aneurysm secondary to Coarctation and reanastomosed the aorta\(^2\).

\(^1\)Steven G. Friedman, History of vascular surgery, second edition, chapter 7, p79
\(^2\) Steven G. Friedman, History of vascular surgery, second edition, chapter 7, p80
Grafts

Homograft
1950 Jacques Oudot

Synthetic grafts
Arthur Voorhees 1948

Endo-grafts
EVAR
1990 Parodi
Homografts.

Carrel (1880–1963) played an important role in the development of arterial grafting, thanks to his contributions with experiments transplantating human and canine vessel leading Jacques Qudot to make the first replacement of thrombosed aorta with an arterial homograft in 19501*.

1*Steven G. Friedman, History of vascular surgery, second edition, chapter 21, p198
Homografts

- The Landmark first AAA resection with restoration of arterial continuity can be credited to **Charles Dubost** 1951, when he replaced an aneurysmatic aorta in a 51 years old man with an aorta of a young girl harvested three weeks previously.

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1°Steven G. Friedman, History of vascular surgery, second edition, chapter 20, p194
The golden age of AAA repair can be credited undoubtley to Cooley and DeBakey.

In 1952, both of them repaired a large thoracoabdominal aneurysma using a homograft, later they successfully used homografts to replace the ascending aorta 1956, and the aortic arch 1957.

They also developed an astounding number of aortic surgical techniques.

DeBeakey classified aortic dissection into different types depending on their site.

In 1973, Crawford simplified Debakey and Cooley’s technique by making sequential clamping of aorta allowing reperfusion of the organs.

Synthetic grafts

In 1952 Voorhees used the first synthetic graft (Vinyon-N) into ruptured AAA, the patient died shortly afterwards from myocardial infarction. In 1954, Voorhess had successfully implanted 17 AAAs with similar grafts*.

The first successful EVAR operation was completed by Parodi in Argentina 1990.

In 1999, the FDA approved the first two AAA stent grafts for widespread use.*

Other Methods

- In 1996, Chen reported the results of laparoscopically assisted abdominal aortic aneurysm repair in 10 patients.¹

- Recently, Matsumoto described the use of minilaparotomy to repair AAA.²

¹Steven G. Friedman, History of vascular surgery, second edition, chapter 7, p85
²Steven G. Friedman, History of vascular surgery, second edition, chapter 7, p85
Thanks

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