



VASCUPEDIA

A brief History of AAA Repair & Surgery

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Ligation

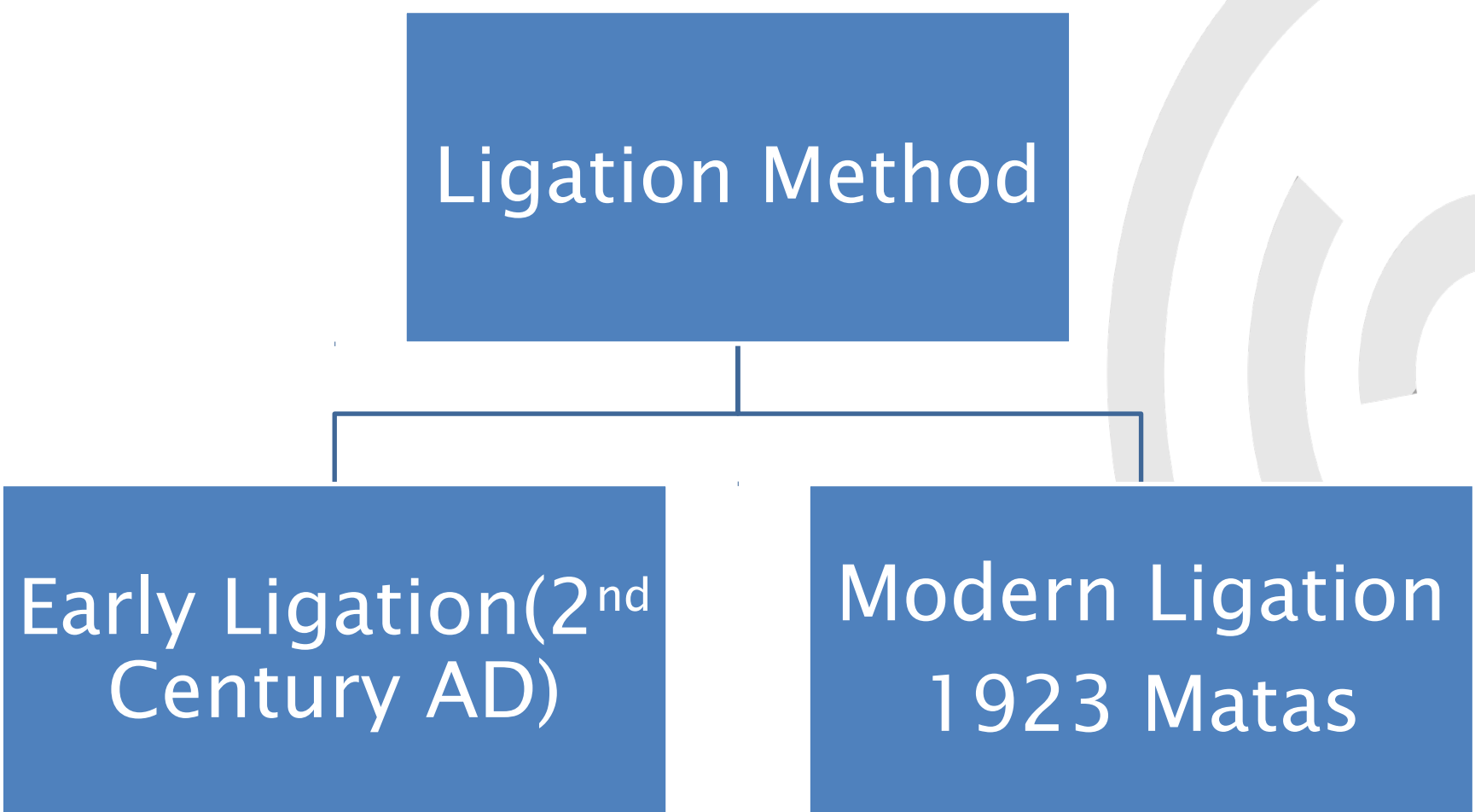
Wrapping

Anastomosis

Grafts

Development of ligation method

Ligation Method



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graph TD; A[Ligation Method] --- B[Early Ligation(2nd Century AD)]; A --- C[Modern Ligation 1923 Matas]
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Early Ligation(2nd
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 und distal ligation of the aorta with central incision of aneurysmal sac to remove the thrombotic material.

* Stehbens WE. History of Aneurysms. Med Hist 1958;2(4):274–80.

Modern ligation method

- ▶ In 1817, **Cooper** ligated the aortic bifurcation in a ruptured iliac aneurysm, the patient died four hours later^{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^{2*}.

^{1*}Steven G. Friedman, History of vascular surgery, second edition, chapter 7, P74

^{2*} Steven G. Friedman, History of vascular surgery, second edition, chapter 7, P77

Matas' contribution to AAA surgery

endoaneurysmorrhaphy*

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

¹*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^{1*}.
- ▶ **Promoting thrombosis:** by introducing foreign material into the aneurismal 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^{2*}.

^{1*}Harrison PW, Chandy J. A subclavian aneurysm cured by cellophane fibrosis. Ann Surg. 1943;118:478.

^{2*}Siddique K, Alvernia J, Frazer K, Lanzino G, Treatment of aneurysms with wires and electricity: a historical overview. J Neurosurg. 2003;99:1102–7.

Albert Einstein and AAA

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

The aneurysm finally ruptured in 1955*

*Cohen JR, Graver LM. The ruptured abdominal aortic aneurysm of Albert Einstein. Surg Gynecol Obstet. 1990;170:455-8

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* 1*}Steven G. Friedman, History of vascular surgery, second edition, chapter 7, p80

Grafts

grafts

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graph TD; A[grafts] --> B[Homograft<br/>1950 Jacques Oudot]; A --> C[Synthetic grafts<br/>Arthur Voorhees 1948]; A --> D[Endo-grafts<br/>EVAR<br/>1990 Parodi];
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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 transplanting human and canine vessel leading **Jacques Qudot** to make the first replacement of thrombosed aorta with an arterial homograft in 1950^{1*}.

^{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*.

¹*Steven G. Friedman, History of vascular surgery, second edition, chapter 20, p194

the golden age of AAA repair

- ▶ The golden age of AAA repair can be credited undoubtedly to **Cooley and DeBakey**.
- ▶ In 1952, both of them repaired a large thoracoabdominal aneurysm 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.
- ▶ DeBakey classified aortic dissection into different types depending on their site.

*D.Cooley MD, A brief history of aortic aneurysm surgery. Aorta 2013;1(1):1-3.

Crawford

- ▶ In 1973, **Crawford** simplified DeBakey and Cooley's technique by making **sequential clamping** of aorta allowing reperfusion of the organs.*

* Green Sy, LeMaire SA, Coselli JS. History of aortic surgery in Houston. In: Chiesa R, Melissano G, Coselli JS et al. Aortic surgery and anaesthesia "How to do it" 3rd Ed. Milan: Editrice San Raffaele. 2008;39-73

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*.

*Blakemore AH, Voorhees AB Jr. The use of tubes constructed from vinyon "N" cloth in bridging arterial defects – experimental and clinical. Ann Surg. 1954;140:324.

Endovascular-gratfs (EVAR)

- ▶ 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.*

*Criado FJ. EVAR at 20: The unfolding of a revolutionary new technique that changed everything. J Endovasc Ther. 2010;17:789-96.

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*}

^{1*}Steven G. Friedman, History of vascular surgery, second edition, chapter 7, p85

^{2*}Steven G. Friedman, History of vascular surgery, second edition, chapter 7, p85

Thanks

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