



MEET 2015

MULTIDISCIPLINARY EUROPEAN
ENDOASCULAR THERAPY

Popliteal Artery Aneurysm What is the best mode of treatment?

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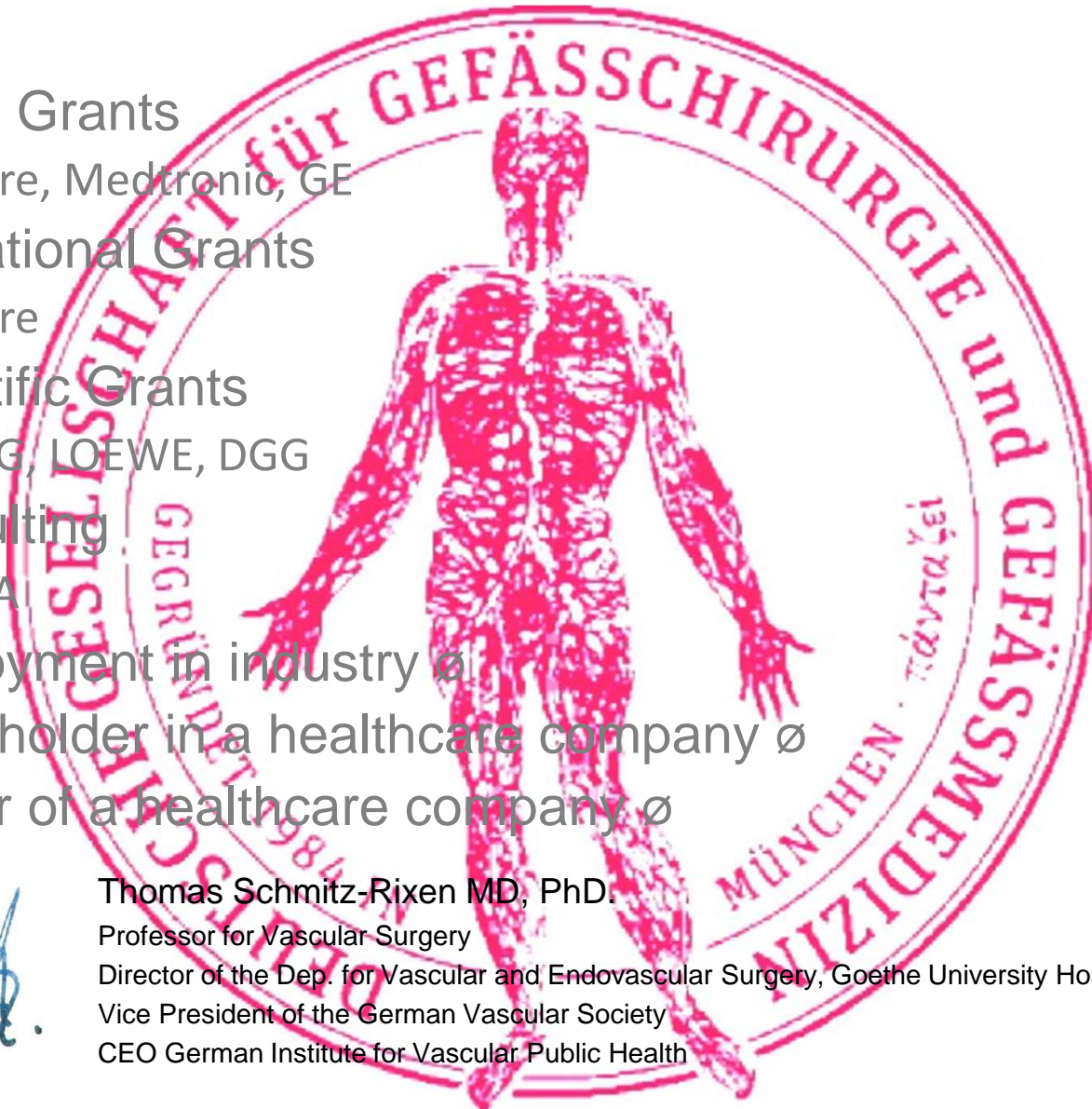


Disclosures in relation to the topic (last 5 years)



- Travel Grants
 - Gore, Medtronic, GE
- Educational Grants
 - Gore
- Scientific Grants
 - DFG, LOEWE, DGG
- Consulting
 - TVA
- Employment in industry ø
- Shareholder in a healthcare company ø
- Owner of a healthcare company ø

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Definition: Popliteal Artery Aneurysm (PAA)

Normal Diameter of the popliteal artery (PA)

- 5 – 11 mm (tapered)

Aneurysm develop

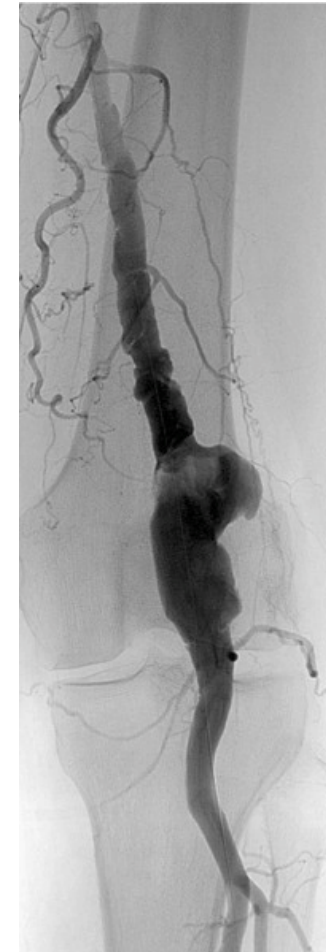
- in the upper third of the PA

Aneurysm definition:

- 1,5 x of the \varnothing of the SFA

Threshold for treatment:

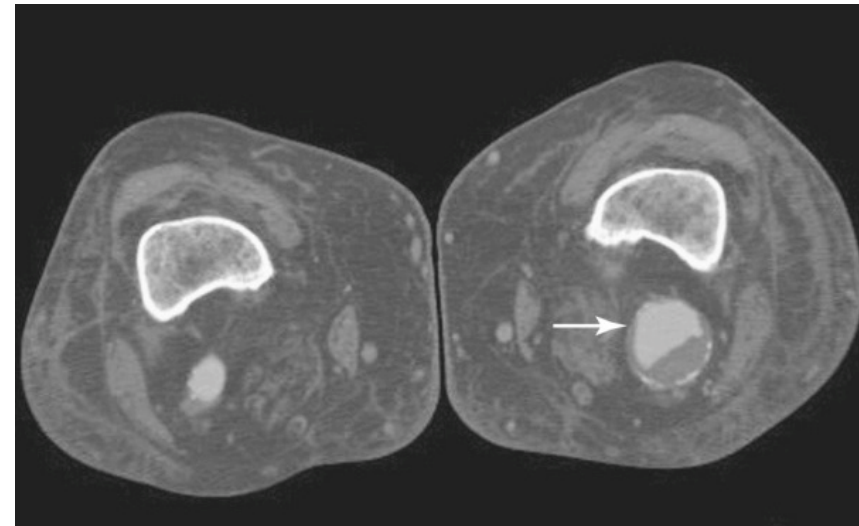
- \varnothing 20 – 25 mm



Epidemiology

- > 95 % m
- 50 % contralateral
- 40 % AAA
- Incidence (in hospital)
 - 7,4 per 100.000 men
 - 1 per 100.000 female

- Prevalence in AAA-Pat: 8 %
 - Probability of aneurysm development in 10y: 50 %



Dawson I, Sie RB, van Bockel JH: [Atherosclerotic popliteal aneurysm. Br J Surg 1997; 84:293-299.](#)

- Incidence: 1% m 65-80y
- Medicare Data:
 - 1000 treatments /y
- Vascunet:
 - 9,6 PAA interventions / million person-years
 - (8 european countries)
 - Range: 3,4 Hungary – 17,6 Schweden

Galiñanes EL, Dombrovskiy VY, Graham AM et al (2013) Endovascular versus open repair of popliteal artery aneurysms: outcomes in the US Medicare population. *Vasc Endovascular Surg* 47: 267-273

Zimmermann A, Wendorff H, Roenneberg C et al (2010) Das Poplitealarterienaneurysma chirurgische und endovaskuläre Therapie. *Zentralbl Chir* 135: 363-368

Björck M, Beiles B, Menyhei G et al (2014) Contemporary treatment of popliteal artery aneurysm in eight countries: a report from the VASCUNET collaboration of registries. *Eur J Vasc Endovasc Surg* 47: 164-171

PAA: the silent leg killer

- Rare rupture
- Asymptomatic: pulsatile mass, silent thromboembolic events
- Symptoms:
 - Distal embolisation or thrombotic occlusion
 - CLI
 - Acute limb ischemia
 - Compression
 - pain, leg swelling, DVT, Peroneus nerv palsy
 - Symptoms correlate with size and thrombus formation



Guideline AHA – Evidence- Level B



- Intervention threshold:
 - $\emptyset > 20$ mm
 - Symptomatic thrombus formation

American College of Cardiology Foundation / American Heart Association. Management of patients with peripheral artery disease. ACCF/AHA Pocket Guideline November 2011

http://my.americanheart.org/idc/groups/ahamah-public/@wcm/@sop/@spub/documents/downloadable/ucm_436821.pdf

Diwan A, Sarkar R, Stanley JC, Zelenock GB, Wakefield TW: Incidence of femoral and popliteal artery aneurysms in patients with abdominal aortic aneurysms. *J Vasc Surg* 2000; 31:863-869.



Surgery on May 22nd 1785

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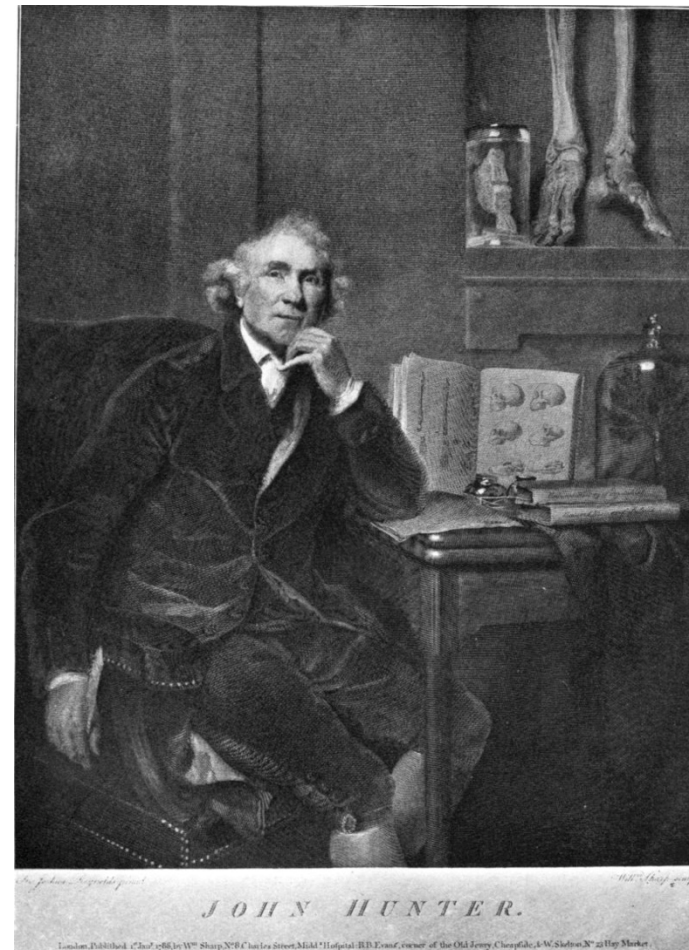
EPOCH-MAKING BOOKS IN BRITISH SURGERY.

By SIR D'ARCY POWER, K.B.E., LONDON.

X. HUNTER'S OPERATION FOR THE CURE OF ANEURYSM.

So obsessed have modern English surgeons become by the name of Lister that it would be difficult for many of them to say off-hand why Hunter is looked upon, by those who know, as the greatest of surgeons. He was a bad lecturer, a confused thinker, and a very indifferent writer, yet he found surgery medieval and clinical; he left it a science. How was it done? Go to the museum he collected and let each one see for himself. Study it and the whole science of surgery is displayed in terms of morbid anatomy, comparative as well as human. Many surgeons before him had collected pathological specimens and made museums, but they had used them solely for teaching purposes and they had passed by sale from teacher to teacher. Hunter alone collected not to teach but to learn, and comparing like with like he thought about them and drew wholly fresh conclusions. A few of his contemporaries and the most receptive of his pupils entered into his spirit. To them he was 'the Dear Man'; they had penetrated his shyness and quarrelsomeness, and to them he was a personality ever urging them to follow out his lines of thought. He thus became the founder of a great school of scientific surgery which owed as much to his successors as to himself for its widespread influence both at home and abroad.

Hunter's work was encyclopedic, for his curiosity was insatiable. We are concerned only with the surgical side, and it is difficult to make a selection. The treatise on inflammation, divested of its rugged style, contains



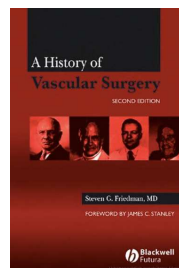
First clinical in situ vein graft – June 12th, 1906

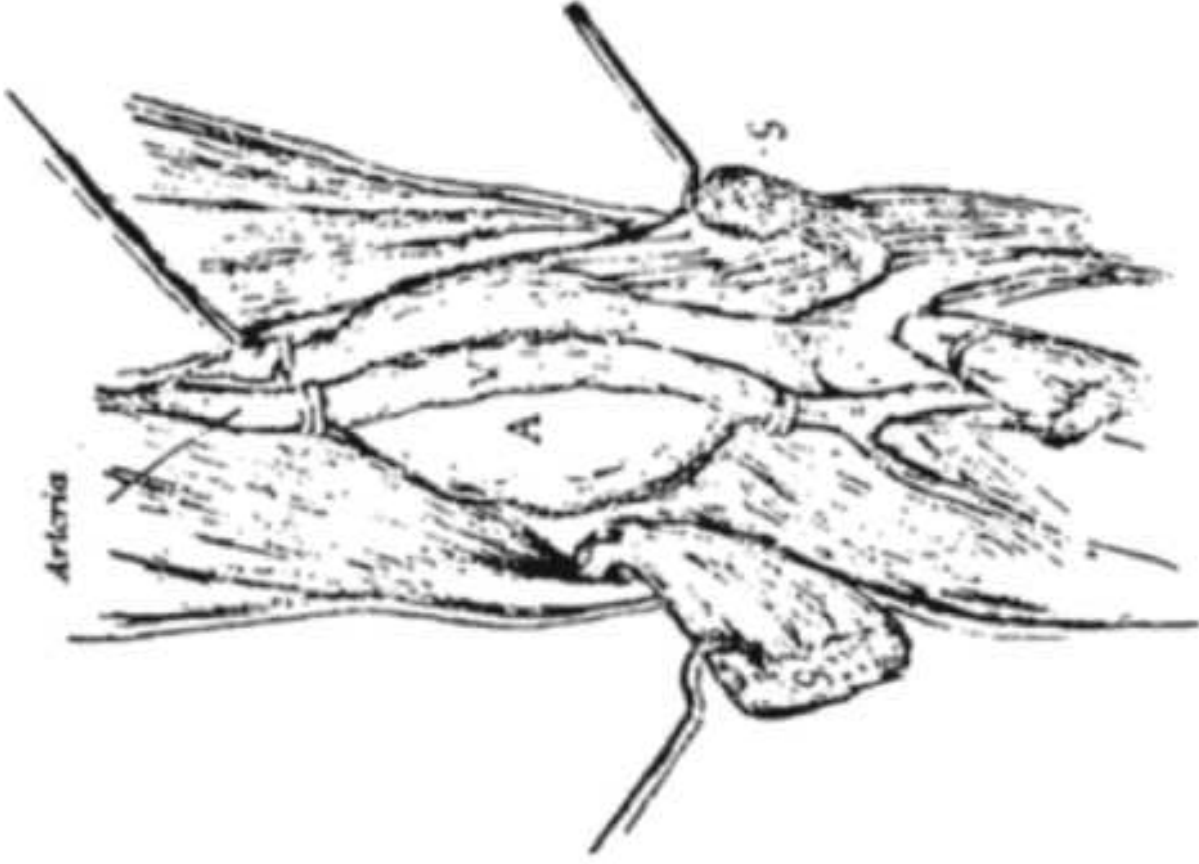
Jose Goyanes of Madrid

- 41y old candy maker with a syphilitic PAA
- In situ repair with popliteal vein
- Reported in *El signo medico*
- Mention of a prior iliac artery repair with an autologous (reversed) vein segment



Figure 6.4 Jose Goyanes (from Harrison LH Jr. Historical aspects in the development of venous autografts. *Ann Surg* 1976; 183:101).





Goyanes - Madrid - 1906

Figure 6.5. Goyanes's in situ bypass of a popliteal aneurysm (from Dale WA. Management of Vascular Surgical Problems. New York: McGraw Hill, 1985).



Standard of care ?

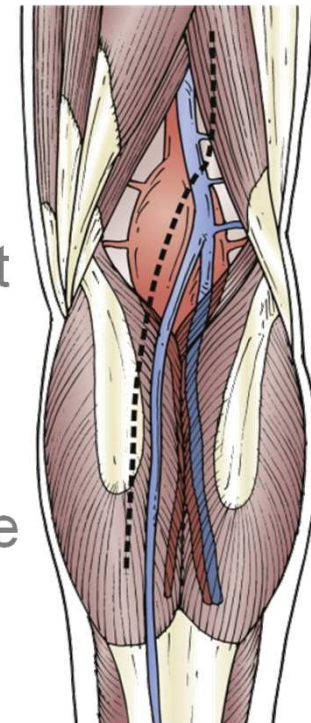


Medial approach

- Preferred technique (?)
- Long extension
- Acute ischemia
- Ligation of the collaterals (30% „Typ 2 endoleak“)

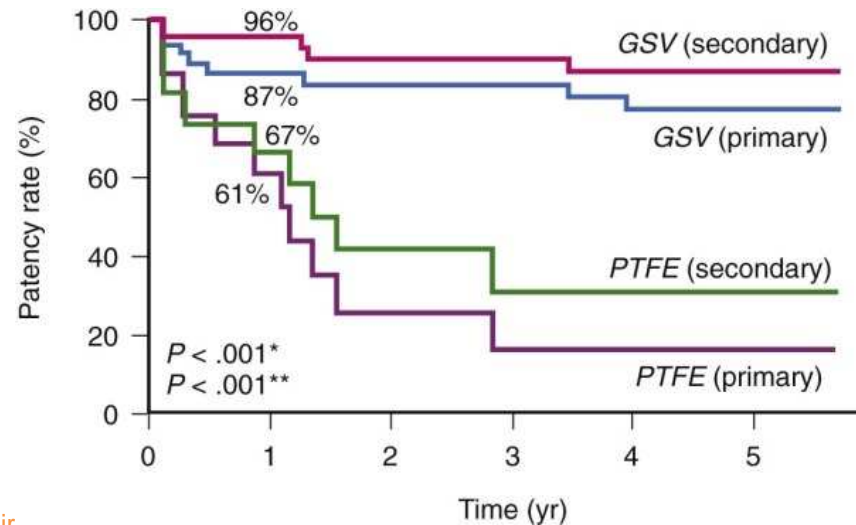
Posterior approach

- Popliteal II Aneurysm
- Decompression at large diameters
- Cave nerv injury
- Secondary in case of „Endoleaks“



Open Surgery 5y results

- Excellent patency
- Excellent limb salvage
- Reintervention rate (20%?)
- Autologous vein > Alloplast



Davies RS, Wall M, Rai S et al (2007) Long-term results of surgical repair of popliteal artery aneurysm. Eur J Vasc Endovasc Surg 34: 714-718

Ravn H, Wanhainen A, Björck M (2008) Risk of new aneurysms after surgery for popliteal artery aneurysm. Br J Surg 95: 571-575

Jones WT 3rd, Hagino RT, Chiou AC et al (2003) Graft patency is not the only clinical predictor of success after exclusion and bypass of popliteal artery aneurysms. J Vasc Surg 37: 392-398

Galland RB (2007) Popliteal aneurysms: from John Hunter to the 21st century. Ann R Coll Surg Engl 89: 466-471

Zimmermann A, Schoenberger T, Saeckl J et al (2010) Eligibility for endovascular technique and results of the surgical approach to popliteal artery aneurysms at a single center. Ann Vasc Surg 24: 342-348

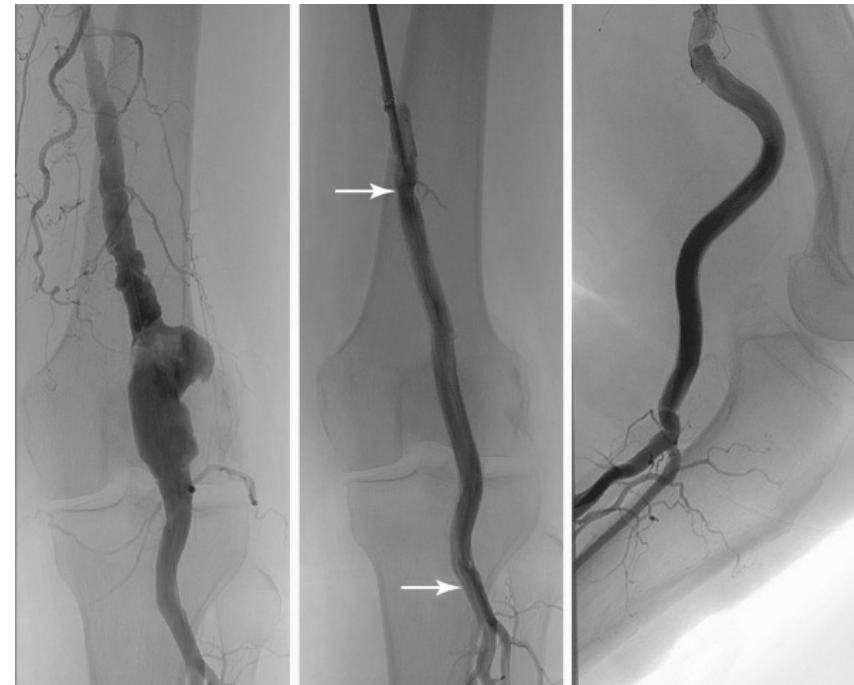
Ravn H, Wanhainen A, Björck M (2007) Swedish Vascular Registry (Swedvasc). Surgical technique and long-term results after popliteal artery aneurysm repair: results from 717 legs. J Vasc Surg 46: 236-243

Kropman RH, Schrijver AM, Kelder JC et al (2010) Clinical outcome of acute leg ischaemia due to thrombosed popliteal artery aneurysm: systematic review of 895 cases. Eur J Vasc Endovasc Surg 39: 452-457

Huang et al. J Vasc Surg 2007

PEVAR

- High risk pat (?)
- Quick and easy
- Low morbidity
- Anatomic Limitations
- Typ 2 endoleaks
- Risk of intraprocedural embolisation
- Cave: sufficient overlap



Idelchik GM, Dougherty KG, Hernandez E et al (2009) Endovascular exclusion of popliteal artery aneurysms with stent-grafts: a prospective single-center experience. *J Endovasc Ther* 16: 215-223

Jung E, Jim J, Rubin BG, Sanchez LA et al (2010) Long-term outcome of endovascular popliteal artery aneurysm repair. *Ann Vasc Surg* 24: 871-875

Etezadi V, Fuller J, Wong S et al (2010) Endovascular treatment of popliteal artery aneurysms: a single-center experience. *J Vasc Interv Radiol* 21: 817-823

Garg K, Rockman CB, Kim BJ et al (2012) Outcome of endovascular repair of popliteal artery aneurysm using the Viabahn endoprosthesis. *J Vasc Surg* 55: 1647- 1653

[Guzzardi G, Fossaceca R, Cerini P](#) (2013) Endovascular treatment of popliteal artery aneurysms: preliminary results. *Radiol Med* 118: 229-238

Trinidad-Hernandez M, Ricotta JJ 2nd, Gloviczki P et al (2013) [Results of elective and emergency endovascular repairs of popliteal artery aneurysms](#). *J Vasc Surg* 57: 1299-1305

Saunders JH, Abisi S, Altaf N et al (2013) Long-term outcome of endovascular repair of popliteal artery aneurysm presents a credible alternative to open surgery. *Cardiovasc Intervent Radiol*

2008 Metaanalysis



- 141 pat
- PEVAR 5,05x higher occlusion rate
- PEVAR 18,8x higher reintervention rate
- 3,9 days less LOS

[Lovegrove RE, Javid M, Magee TR et al \(2008\) Endovascular and open approaches to non-thrombosed popliteal aneurysm repair: a meta-analysis. Eur J Vasc Endovasc Surg 36: 96-100](#)

Trial details

- Meta-Analysis
 - 1 RCT
 - 3 Kohort – Studies.
 - ER (n=43) vs. OR (n=116)
- Cumulative analysis for PEVAR with another 27 case studies
 - n=1 to n= 73 / total n=320

Results

- Primary patency 1y:
 - PEVAR 83,7% (36/43) / OS 85,3% (99/116)
- Secondary patency 1y:
 - PEVAR 86% (37/43) / OS 94,8% (110/116)
- Primary patency PEVAR 3y:
 - 6 studies (n= 139): 74%
- Secondary patency PEVAR 3y:
 - 5 studies (n= 141): 85%

Open questions 2015

- PEVAR vs Oberschenkel
- Approach in OS
- Reconstruction material
- Fibrinolysis in acute ischemia
- Gender
- In- and outflow procedures
- Amputation rate
- Regional differences



RCT calculation

- OVERPAR
 - Asymptomatic patients
 - No stratification
- Our RCT calculation:
 - 800 Procedures
 - with stratifications > 1200 Procedures



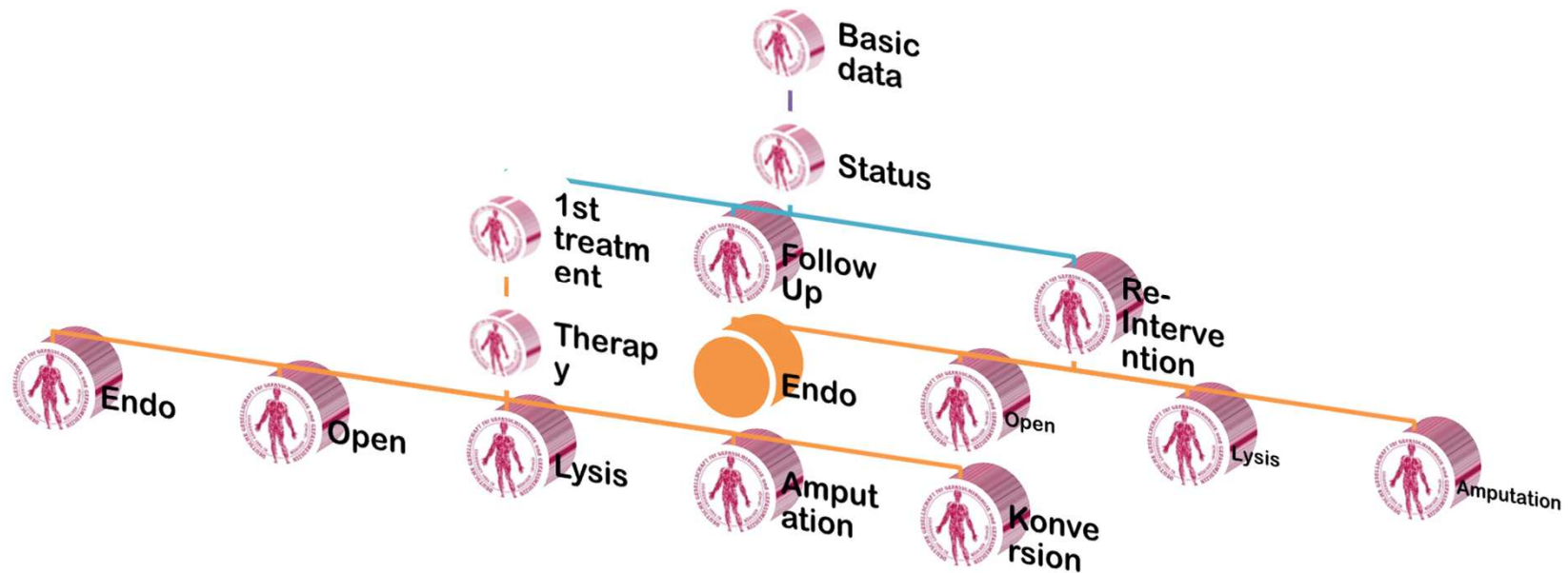
Prospective Registry



- Consecutive cases www-based
 - OS
 - PEVAR
 - Fibrinolysis
 - Surveillance
 - Amputation
- 5y follow up



Systematic



Benefit for participants



- Improve quality
- Bench mark at yearly intervals

PLEASE COME
AND JOIN



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Basic data

- Genderage
- Indication
- Diameter
- Inflow / Outflow
- Previous interventions
- Therapy
- Thrombolysis
- Open surgery approach
- Material
- Stentgraft diameter, nr.
- Complications
- LOS

Yearly follow up, 5y

- Survival
- Patency
- Reinterventions
- Stentfracture / Instent Stenosis / Edge Stenosis
- Endoleak
- Symptoms
- Amputation
- Readmission
- Quality of life (SF 36)