

Vascular Surgery: Peripheral Artery Disease

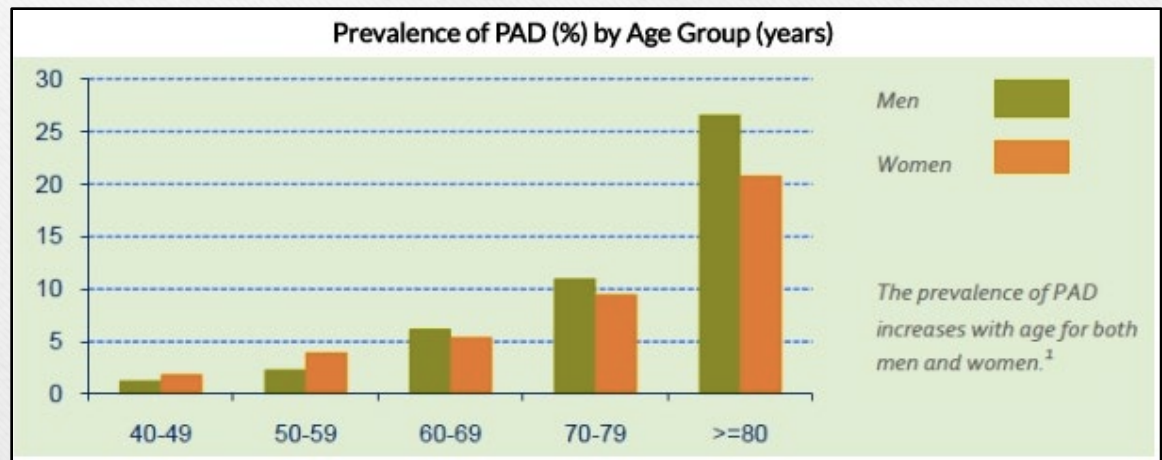
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Peripheral artery disease (PAD): Overview

- Signs and symptoms of PAD
- Indications for, and treatment of PAD
- Chronic limb-threatening ischemia (CLTI)
 - Review the only 2 CLTI RCT
- A few technical discussion points
- A few surgical & wound photos

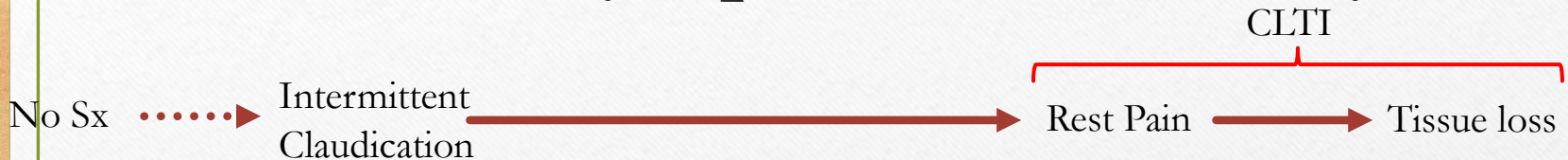
Peripheral Arterial Disease (PAD)

- Affects upwards of **8-12 million people** in US alone
- Why is this devastating?
 - Impairs function
 - Reduces QoL
 - Wounds, limb loss
 - Assc. risk of MI/stroke
- Increased prevalence with:
 - Age
 - Smoking
 - Diabetes Mellitus
 - Hypertension
 - Obesity



https://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_pad.htm

PAD: Symptoms = Severity



CV Mortality

Amputation

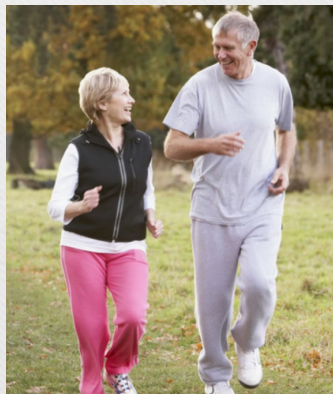
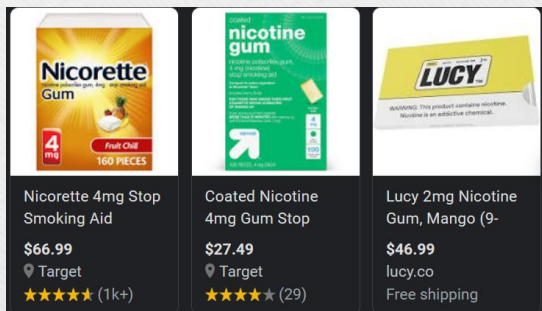
25%

↑
<1% Amp risk

CLI (Critical limb ischemia) [Old term]
= CLTI (Chronic limb-threatening ischemia) [New term]
= Rest Pain or Tissue Loss

Peripheral artery disease: Treatment

- What is the treatment for PAD causing claudication?
-
- Walking regimen
 - Risk factor modification – DM, Tob, CKD
 - Statin, ASA
 - Cilostazol



Peripheral artery disease: Treatment

- What about angioplasty/stenting/other endo. for claudication?
 - Frequently performed in USA for “lifestyle-limiting” claudication
 - However:

Endovascular interventions for claudication do not meet minimum standards for the Society for Vascular Surgery efficacy guidelines

[J Vasc Surg. 2021 May;73\(5\):1693-1700.e3.](#)

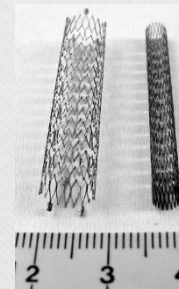
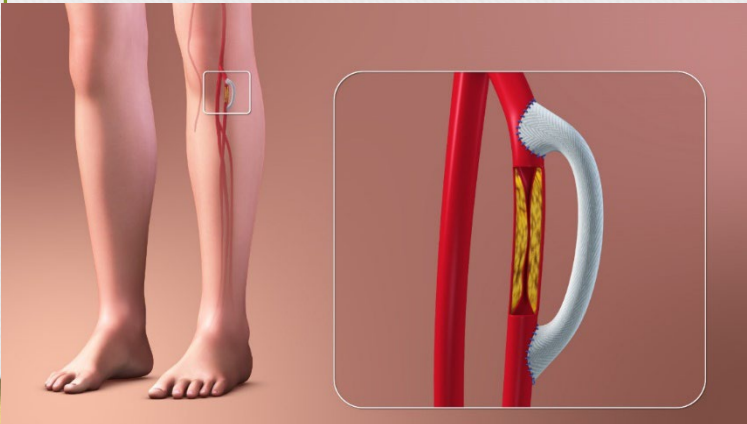
Jonathan Bath ¹, Peter F Lawrence ², Dan Neal ³, Yuanyuan Zhao ³, Jamie B Smith ⁴, Adam W Beck ⁵, Michael Conte ⁶, Marc Schermerhorn ⁷, Karen Woo ²

- Vascular quality initiative study of 16,152 patients, 2004-2017
- At 2 years, only 32% free from symptom recurrence (min. 50% at 2 years)
- As claudication is a lifestyle problem, not a life- or limb-threatening one, durability is imperative
- Problematic at best

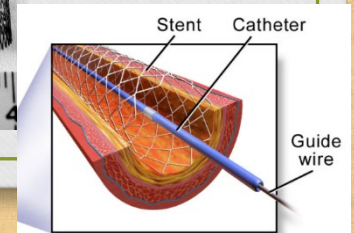
Peripheral artery disease: Treatment

- What is the treatment for PAD causing CLTI?
- Risk factor modification – but not alone
 - High-intensity statin (Atorva 40 or 80, Rosuva 20 or 40)
- Revascularization is needed to reduce limb loss
 - Bypass or Endovascular revascularization
 - Goal to limit major amputation (Foot loss)

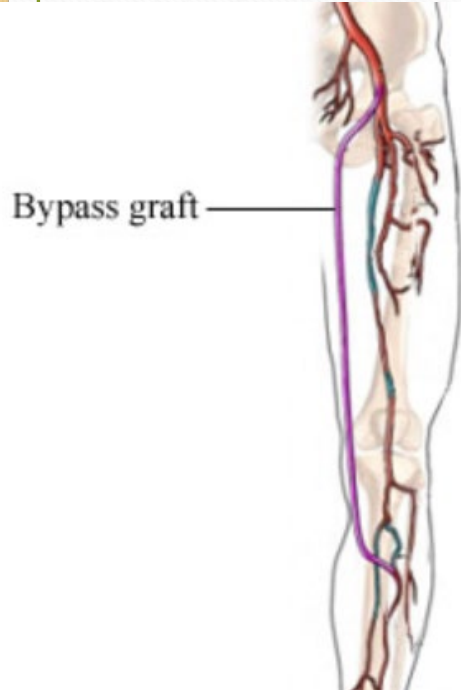
Bypass



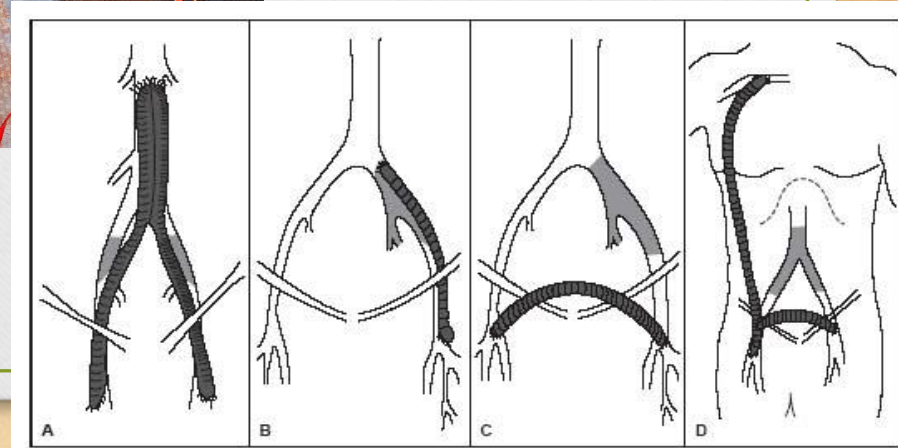
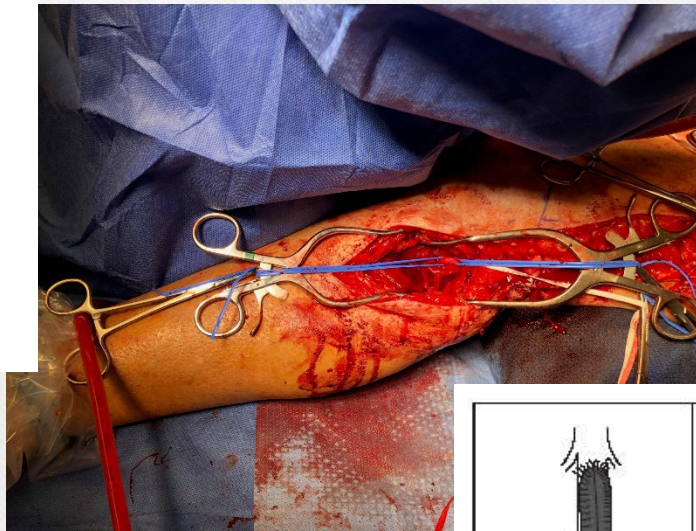
Stenting



Peripheral artery disease: Bypass



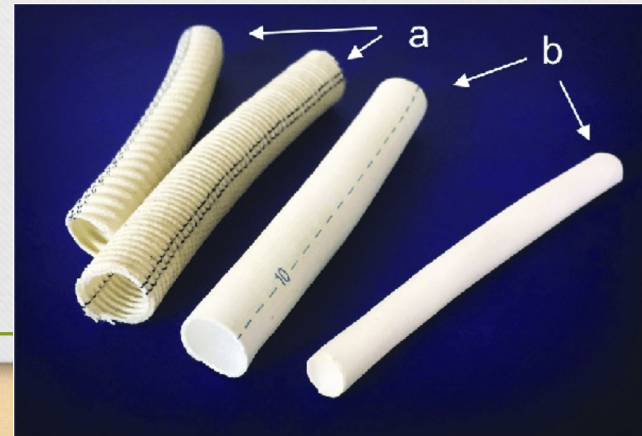
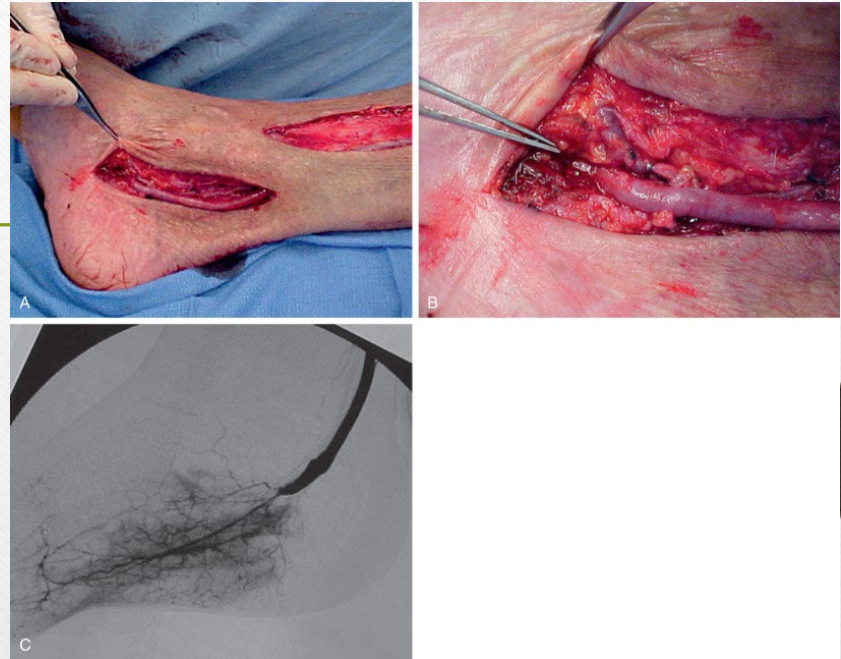
1. Inflow
2. Outflow
3. Conduit



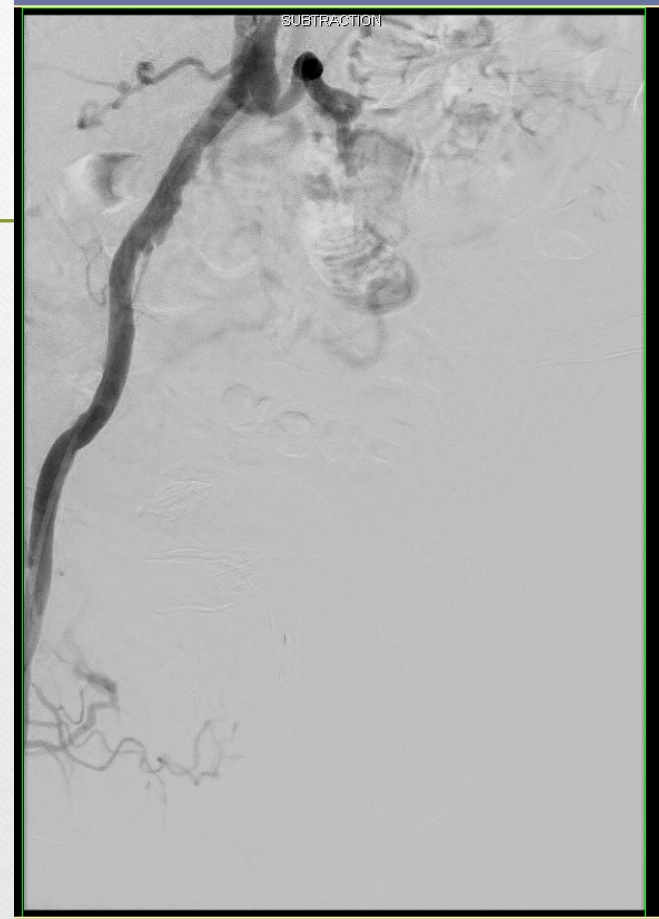
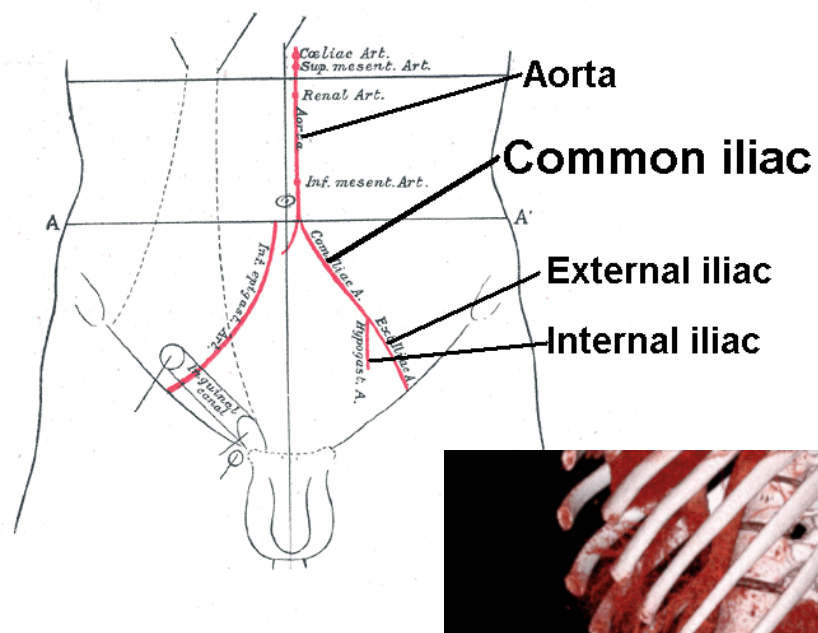
Peripheral artery disease: Bypass

1. Inflow
2. Outflow
3. **Conduit**

1. Autogenous vein
 1. GSV
 2. Other
2. Everything else
 1. PTFE
 2. Dacron
 3. Cryopreserved cadaver vessel



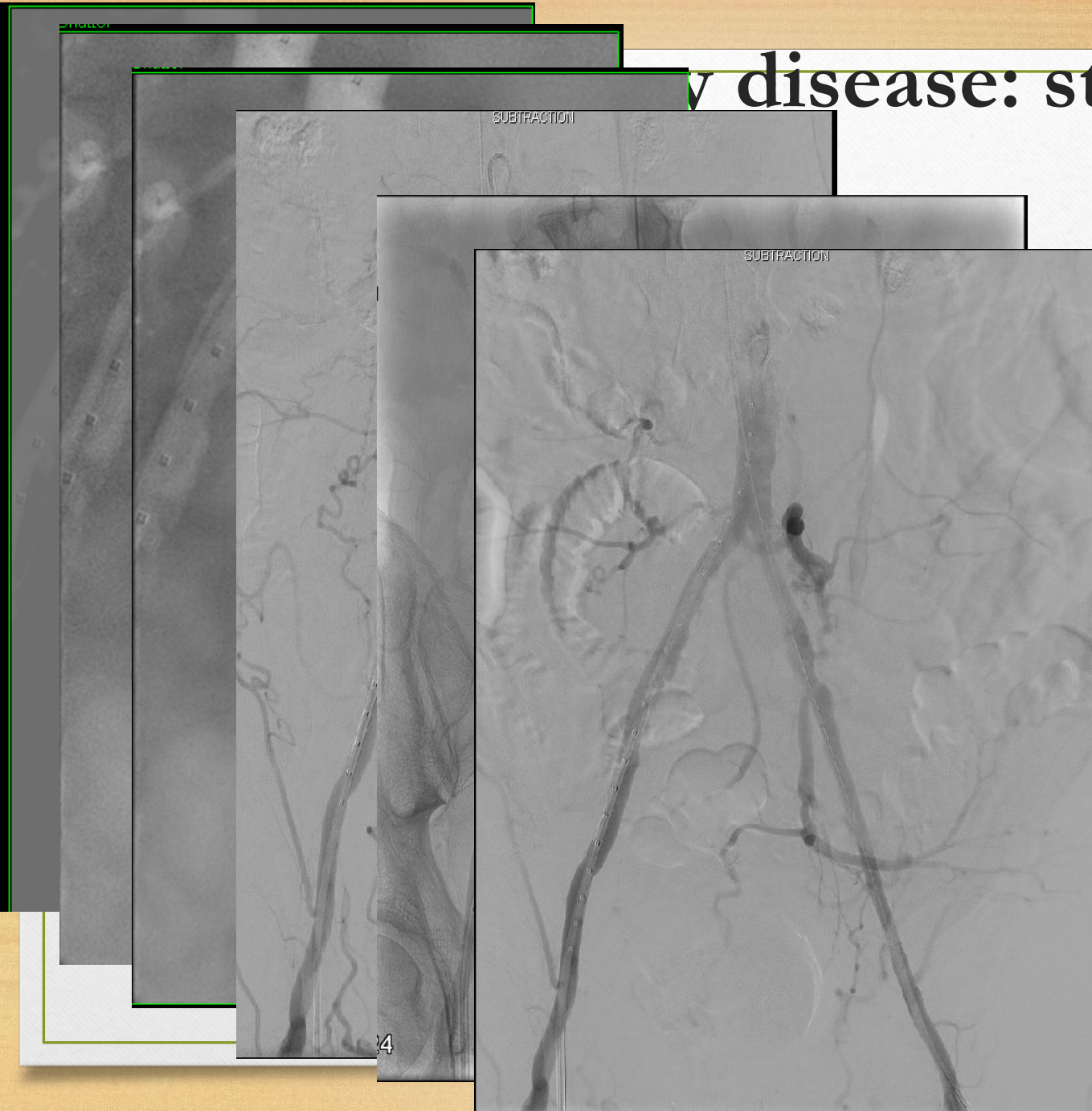
Peripheral artery disease: Stenting



1. Arterial access
2. Cross the lesion
3. Treat the lesion

Arterial disease: stenting

1. Arterial access
2. Cross the lesion
3. Treat the lesion



Peripheral artery disease: Evidence

Bypass versus Angioplasty in Severe Ischaemia of the Leg (BASIL) trial: An intention-to-treat analysis of amputation-free and overall survival in patients randomized to a bypass surgery-first or a balloon angioplasty-first revascularization strategy

J Vasc Surg. 2010 Dec;52(6):1751.

- Very little level-1 evidence in the treatment of PAD
- BASIL:
 - Compared bypass to endovascular treatment for CLI
- UK, completed in 2010, 452 pts, 228 bypass, 224 “balloon endo” (stents not used)
- At 5 year follow up, >50% of patient dead, 7% had an amputation
- No significant difference in amputation-free survival

BASIL trial takeaway message

Bypass versus Angioplasty in Severe Ischaemia of the Leg (BASIL) trial: An intention-to-treat analysis of amputation-free and overall survival in patients randomized to a bypass surgery-first or a balloon angioplasty-first revascularization strategy

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- **If** open and endovascular revascularization achieve the same rates of limb salvage, then choice is up to the patient & provider
 - Endovascular is outpatient, safer in the short term
 - (better reimbursed per unit time)
 - Many specialties can perform
 - Preferred by patient and operator
 - Roll for lower extremity bypass in PAD limited:
 - Endo failure
 - Young patients
 - Teaching centers

Peripheral artery disease: Evidence

The BEST-CLI trial is nearing the finish line and promises to be worth the wait

[J Vasc Surg. 2019 Feb;69\(2\):470-481.e2.](#)

- Best Endovascular vs best Surgical Therapy in CLTI (BEST-CLI)
- 2,100 patients at >130 centers (U.S. NHLBI sponsored) randomized to endo (any) vs bypass
 - A multi-disciplinary panel at each institution determined patients' candidacy
 - Including surgeons and non-surgeon interventionalists
 - Endovascular revascularization at the discretion of the operator, including atherectomy, drug-coated balloon, drug-elluting stenting
- CLI = CLTI = Rest pain or tissue loss
 - Not Claudication

Peripheral artery disease: Evidence

Surgery or Endovascular Therapy for Chronic Limb-Threatening Ischemia

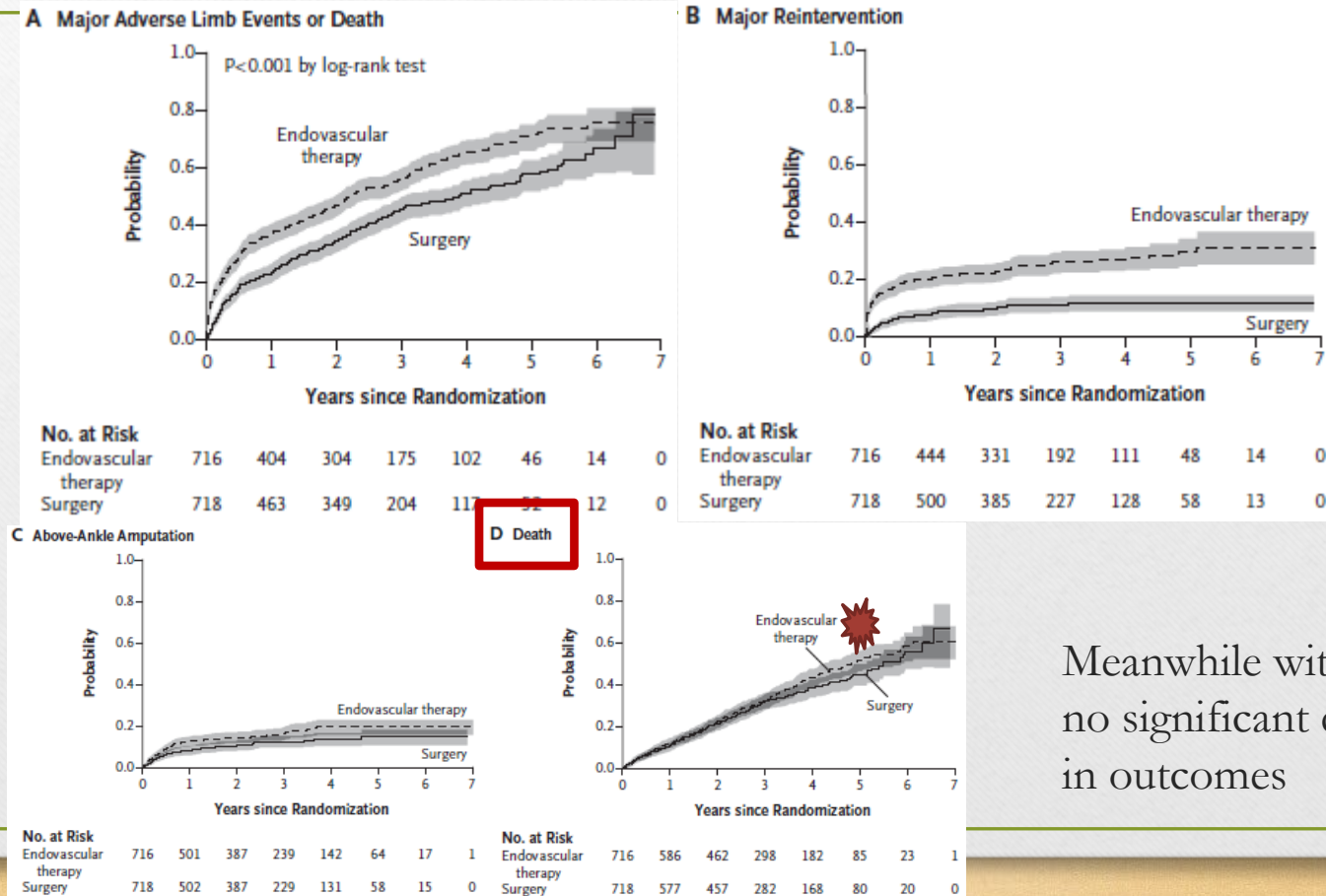
N Engl J Med. 2022 Dec 22;387(25):2305-2316.

- Split into 2 cohorts based on a pre-op characteristic:
 - Cohort 1: With great saphenous vein (GSV) available
 - Cohort 2: No adequate GSV available, requiring alternative conduit for bypass
- 1,830 patients randomized
 - With GSV – 1,420
 - 709 surgical bypass – 307 Fem-pop, 276 Fem-tib, 115 Pop-tib/pedal
 - 711 endovascular revascularization
 - No GSV – 393
 - 194 surgical bypass
 - 199 endovascular revascularization

Peripheral artery disease: Evidence Surgery or Endovascular Therapy for Chronic Limb-Threatening Ischemia

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With GSV:



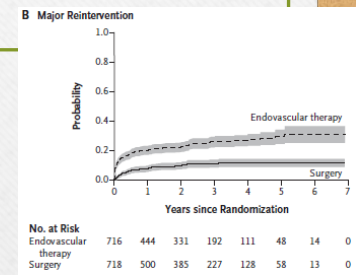
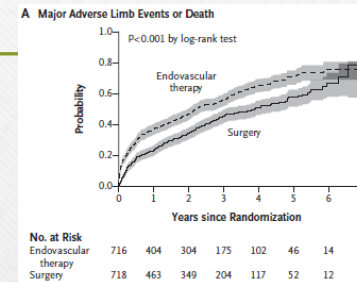
Meanwhile without GSV,
no significant difference
in outcomes

Best-CLI trial takeaway message

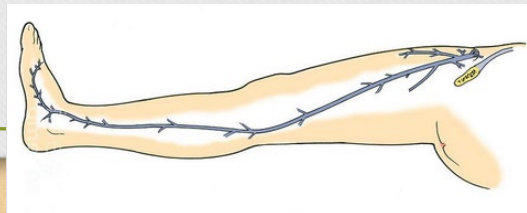
Surgery or Endovascular Therapy for Chronic Limb-Threatening Ischemia

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- An “Always endovascular first” approach to limb salvage in CLTI probably not appropriate



- Patients should be assessed for saphenous vein before intervention
- Roll for lower extremity bypass and for endovascular revascularization



Questions

Quiz

- What is the treatment for claudication?
- What is CLTI?
- What's better, bypass or angioplasty +/- stenting?
- Into which 3 vessels does the popliteal artery split?

Thank you from Valley Vascular Surgery



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- Referrals via Epic
- Questions on operation, referral workflow: Contact Sejla Suta, Manager