ANGIOPLASTY VS BYPASS:

FEMOROPOPLITEAL OCCLUSIVE DISEASE

WINNIPEG VASCULAR & ENDOVASCULAR SYMPOSIUM 2026

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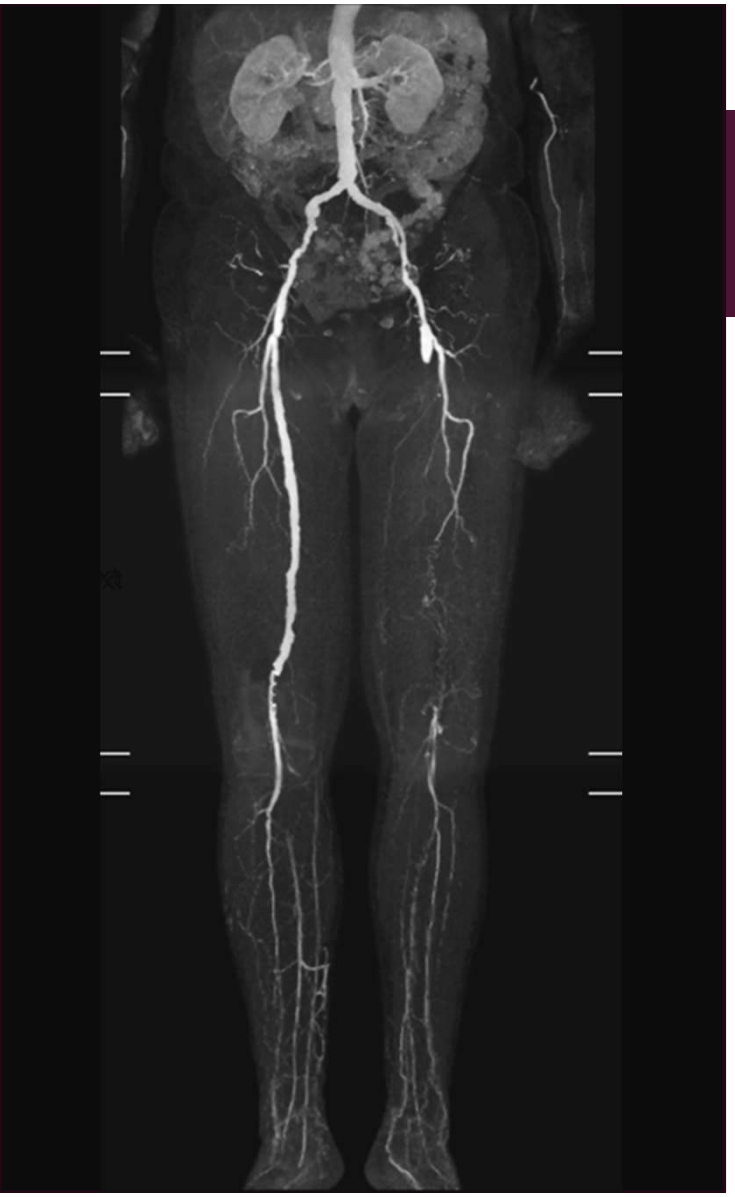
PRESENTER DISCLOSURE

- I have no current relationships with commercial entities.



CHRONIC CLIMB THREATENING ISCHEMIA

CLTI is a clinical syndrome defined by the presence of peripheral artery disease AND:

- Rest pain
- Gangrene
- Lower limb ulceration >2 weeks duration

Within 1 year of presentation:

25% progress to major limb amputation

25% die of cardiovascular complications

OPEN SURGERY VS. ENDOVASCULAR

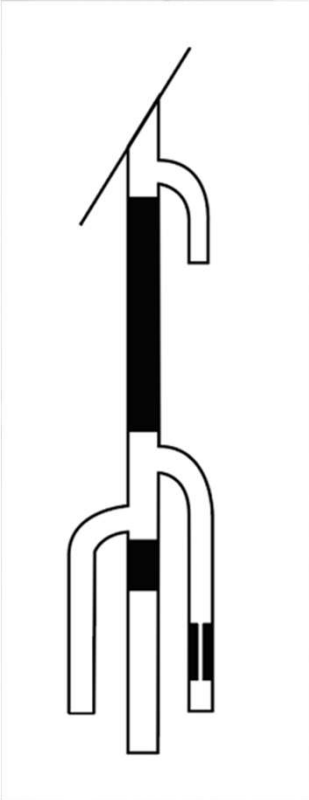
- Technical success
- Morbidity and mortality
- Patency, reintervention rates
- Limb preservation

CASE

- 65-year-old woman
- T2DM, HTN, DLD
- 50 pack/year smoker

- Left leg rest pain, no tissue loss
- Employed in a warehouse

- Palpable femoral pulse
- ABI 0.4



Left leg GSV:

- 4 mm thigh
- 3 mm knee
- 3 mm ankle

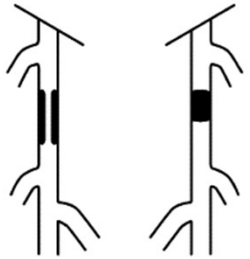
What procedure would you offer?

A. Endovascular recanalization
B. Open bypass with GSV
C. Open bypass with alternative vein
D. Open bypass with prosthetic

2000-
TRANS-ATLANTIC INTER-SOCIETY CONSENSUS DOCUMENT

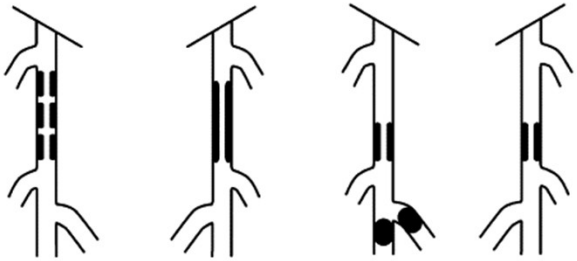
Type A lesions

- Single stenosis ≤10 cm in length
- Single occlusion ≤5 cm in length



Type B lesions:

- Multiple lesions (stenoses or occlusions), each ≤5 cm
- Single stenosis or occlusion ≤15 cm not involving the infrageniculate popliteal artery
- Single or multiple lesions in the absence of continuous tibial vessels to improve inflow for a distal bypass
- Heavily calcified occlusion ≤5 cm in length
- Single popliteal stenosis

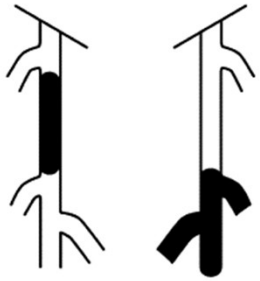


Type C lesions

- Multiple stenoses or occlusions totaling >15 cm with or without heavy calcification
- Recurrent stenoses or occlusions that need treatment after two endovascular interventions

Type D lesions

- Chronic total occlusions of CFA or SFA (>20 cm, involving the popliteal artery)
- Chronic total occlusion of popliteal artery and proximal trifurcation vessels



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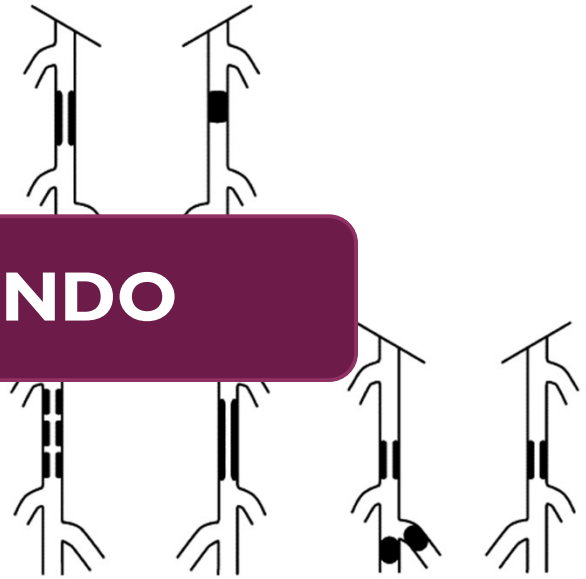
ENDO



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OPEN

2019-
GLOBAL VASCULAR GUIDELINES

- Evidence-based revascularization "PLAN"

THE GLOBAL LIMB ANATOMIC STAGING SYSTEM (GLASS)

Femoro-Popliteal (FP) Grading	
0	Mild or no significant (<50%) disease
1	Total length SFA disease <1/3 (<10 cm); may include single focal CTO (<5 cm) as long as not flush occlusion; popliteal artery with mild or no significant disease
2	Total length SFA disease 1/3–2/3 (10–20 cm); may include CTO totaling <1/3 (10 cm) but not flush occlusion; focal popliteal artery stenosis <2 cm, not involving trifurcation
3	Total length SFA disease >2/3 (>20 cm) length; may include any flush occlusion <20 cm or non-flush CTO 10–20 cm long; short popliteal stenosis 2–5 cm, not involving trifurcation
4	Total length SFA occlusion >20 cm; popliteal disease >5 cm or extending into trifurcation; any popliteal CTO

Infra-Popliteal (IP) Grading	
0	Mild or no significant (<50%) disease
1	Focal stenosis <3 cm not including TP trunk
2	Total length of target artery disease <1/3 (<10 cm); single focal CTO (<3 cm not including TP trunk or target artery origin)
3	Total length of target artery disease 1/3–2/3 (10–20 cm); CTO 3–10 cm (may include target artery origin, but not TP trunk)
4	Total length of target artery disease >2/3 length; CTO >1/3 (>10 cm) of length (may include target artery origin); any CTO of TP trunk

THE GLOBAL LIMB ANATOMIC STAGING SYSTEM (GLASS)

GLASS stages based on FP and IP grade.

		Infrainguinal GLASS Stage				
FP Grade	4	III	III	III	III	III
	3	II	II	II	III	III
	2	I	II	II	II	III
	1	I	I	II	II	III
	0	NA	I	I	II	III
		0	1	2	3	4
		IP Grade				

- **Stage 1**: Average Complexity
  - Technical failure <10%
  - 1-year LBP >70%
- **Stage 2:** Intermediate Complexity
  - Technical failure <20%
  - 1-year LBP 50-70%
- **Stage 3:** High Complexity
  - Technical failure >20%
  - 1-year LBP <50%

BYPASS VERSUS ANGIOPLASTY IN SEVERE ISCHEMIA OF THE LEG

2005
BASIL

- Bypass (75% vein) (228) vs POBA (224)
- Primary Outcome: Amputation free survival

	Bypass	POBA
Technical Success	97%	80%
Reintervention	18% at 1 year	26% at 1 year
Morbidity	57% (wound complications)	41%
Mortality	No difference at 30 days *** Beyond 2 years, greater overall survival**	No difference at 30 days
Major Amputation	***Beyond 2 years, greater amputation free survival**	

SURGERY OR ENDOVASCULAR THERAPY FOR CHRONIC LIMB-THREATENING ISCHEMIA

2022
BEST-CLI

- **Cohort 1**: Single segment GSV bypass (709) vs best endovascular treatment (711)
  - Primary Outcome: Composite of death or MALE

	GSV Bypass	Endovascular
Reintervention	**14%**	**26%** ****66 of 108 cases of early failure were treated with bypass within 30d**
Morbidity	No difference of MACE within 30d	
Mortality	No difference in perioperative mortality	
Major Amputation	**10.4%**	**14.9%**

VEIN BYPASS FIRST VERSUS BEST ENDOVASCULAR TREATMENT FIRST REVASCULARISATION STRATEGY FOR PATIENTS WITH CLTI

2023
BASIL-2

- Infrapopliteal vein bypass (172) vs best endovascular treatment (173)
- Primary Outcome: Amputation free survival

	Vein Bypass	Endovascular
Reintervention	5%	19%
Morbidity	No significant difference (42-46%)	
Mortality	53% at 2 years **6% at 30 days** **Cardiovascular and respiratory events were the dominant cause of death within 30 days**	45% at 2 years **3% at 30 days**
Limb Preservation	No significant difference (18-20%)	

TAKEAWAYS

2005 BASIL	2022 BEST CLI	2023 BASIL-2
• Patients >2 year life expectancy should receive **open surgery first approach**	• Patients with ssGSV should receive **open surgery first approach**	• Patients have **higher morality after open surgery**, but similar limb-based outcomes

Endovascular intervention had universally higher re-intervention rates

Patients with CLTI, suitable single segment GSV and reasonable operative risk profile should receive an open surgery first approach

CASE

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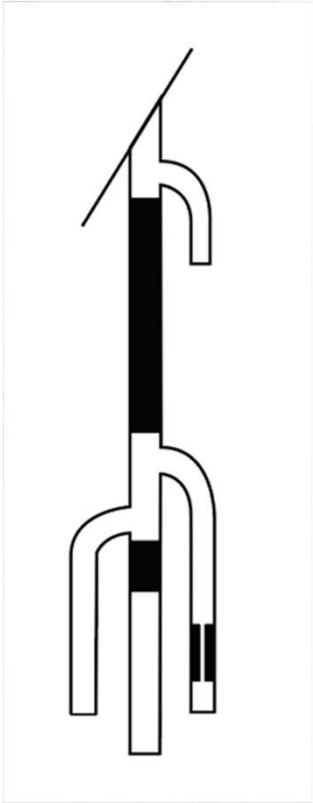
- Employed in a warehouse

- Palpable femoral pulse
- ABI 0.4



Bilateral GSV:

- **stripped**

What procedure would you offer?

A. Endovascular recanalization

~~B. Open bypass with GSV~~

C. Open bypass with alternative vein

D. Open bypass with prosthetic

ALTERNATIVE BYPASS CONDUIT VS ENDOVASCULAR

2022
BEST-CLI

- **Cohort 2**: Alternative conduit bypass (194) vs best endovascular (199)
  - 48 alternative vein, 119 prosthetic
  - 50% Fem-pop, 41% Fem-tib, and 9% Pop-tib targets
  - Primary Outcome: Composite of death or MALE

	Alternative Bypass	Endovascular
Technical Success	100%	80% 26 of 37 patients underwent bypass within 30d
Morbidity	No difference of MACE within 30d	
Reintervention (1.6 years)	**14%	26%
Mortality	**No difference in perioperative mortality**	
Limb Preservation	**No significant difference (14-15%)**	

*** Expected 2-year primary patency for prosthetic (50-60%) and alternative vein (50-70%)*

"BURNING BRIDGES": DOES ENDO FIRST IMPEDE FUTURE BYPASS?

European Journal of
Vascular & Endovascular Surgery

Editor's Choice – Bypass After Failed Endovascular Intervention Is Associated with an Increased Risk of Above Ankle Amputation Among Patients with Chronic Limb Threatening Ischaemia in a Randomised Trial Population ☆

Alik Farber [a,*], Matthew T. Menard [b], Michael S. Conte [c], Kenneth Rosenfield [d], Caitlin W. Hicks [e], Gheorge Doros [a], Michael B. Strong [b], Kim Houlind [f], Philippe Kolh [g], Jeffrey J. Siracuse [a]

- Secondary analysis of BEST CLI data
- Cohort 1: 665 primary bypass and 158 secondary bypass | Cohort 2: 192 primary bypass and 45 secondary bypass
- Time to SB after ENDO occurred at a median of 28 days in all patients and at a median of 210 days in those who had a successful initial ENDO procedure.
- Secondary bypass was associated with **increased above ankle amputation in cohort 1 (13.5% *vs.* 7.4%)**
- **Not statistically significant in cohort 2 (15.9% *vs.* 10.9%)**

"BURNING BRIDGES": DOES ENDO FIRST IMPEDE FUTURE BYPASS?

European Journal of
Vascular & Endovascular Surgery

Editor's Choice – Infrainguinal Bypass Following Failed Endovascular Intervention Compared With Primary Bypass: A Systematic Review and Meta-Analysis☆

Saiiid Hossain [a], Dominic Leblanc [a], Alik Farber [b], Adam H. Power [a],
Guy DeRose [a], Audra Duncan [a], Luc Dubois [a,c,*]

- 15 studies involving 11,886 patients
- Primary bypass vs bypass after failed endovascular intervention
- No difference in 30 day mortality or 30 day amputation rates
- **One year amputation free survival was higher in primary bypass**
- **Worse one-year primary patency in bypass after failed endovascular intervention**
  - Change in distal target after failed endovascular

CASE

- **80-year-old woman**
- T2DM, HTN, DLD, CKD
- 70 pack/year smoker

- Great toe dry gangrene
  - **WIFi stage 4 (2,3,0)**
- From home, caregiver for spouse

- Palpable femoral pulse
- ABI 0.3

Bilateral GSV:

- **stripped**

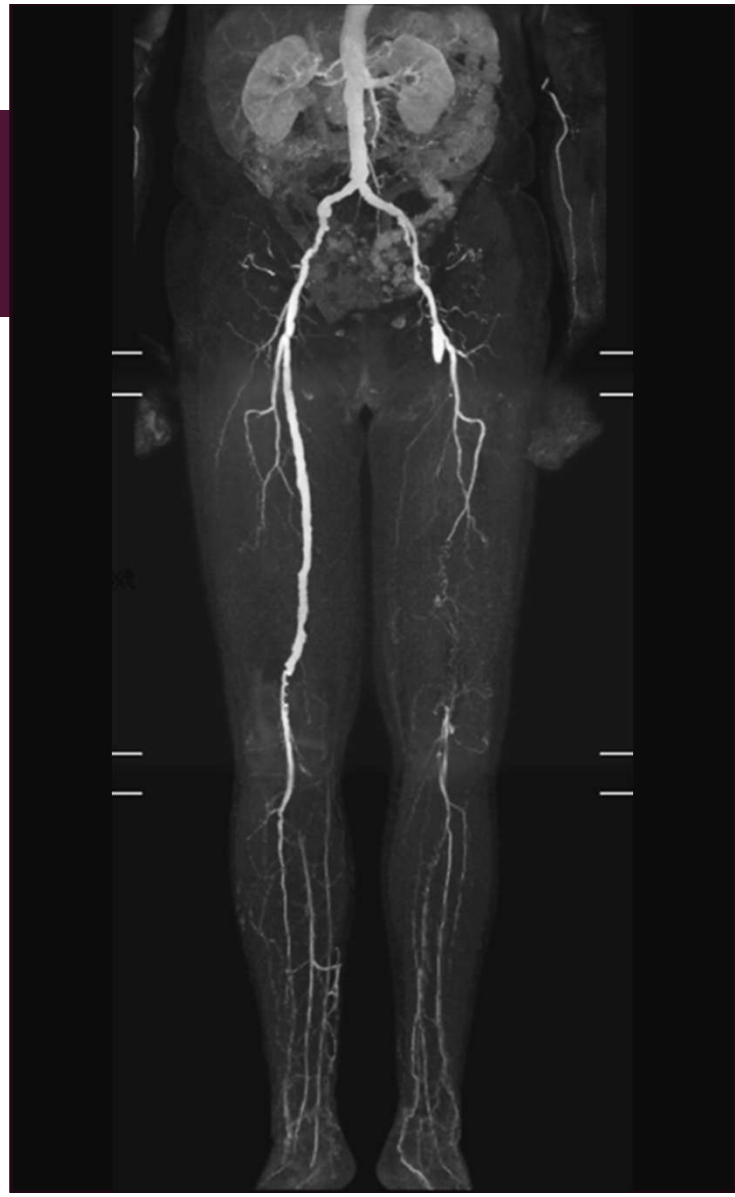
What procedure would you offer?

A. Endovascular recanalization
B. Open bypass with alternative vein
C. Open bypass with prosthetic
D. Primary amputation

CONCLUSIONS

- **Revascularization is nuanced.** Not "one size fits all"
  - Dependent on anatomy, conduit availability, patient factors

- If a patient has a suitable ssGSV, and a reasonable life expectancy/risk profile, **open bypass should be offered first**
- There is **equivalence of endo vs alternative bypass**
  - Recognize that many patients will require repeat interventions, **plan to "fail forward"**
  - In single vessel runoff, attempt alternative bypass before endovascular intervention



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