2024 MID-ATLANTIC CONFERENCE

12th ANNUAL CURRENT CONCEPTS IN

VASCULAR THERAPIES

2024

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The Acute vs Chronically Ischemic Lower Limb – When is This an Emergency?

Disclosures

- Yesterday I received $175 in the mail for filling out a long 3rd party survey about a Philips product a few months ago
- Other than that, none

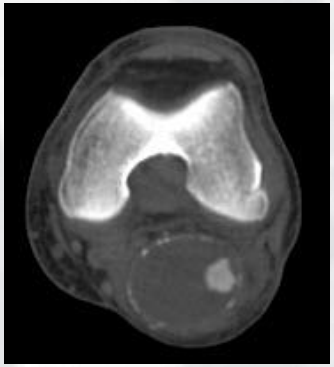
Short Answer

- *Purely* chronic lower limb ischemia is **never** a true emergency
- Acute on chronic limb ischemia is rarely a surgical emergency
- Acute limb ischemia is usually a surgical emergency
  - Good physical exam identifies the few exceptions

Chronic Limb Ischemia

- Can occasionally be a surgical URGENCY
  - Tissue loss with wet gangrene
    - a/w ascending infection/fasciitis/sepsis/AKI etc
      - High rate of major amputation, morbidity, and mortality if local infection not quickly addressed surgically
      - Revasc best done after infection controlled
  - Severe Ischemic Rest Pain
    - Generally difficult to medically manage pain
    - Expedite angio and intervention or surgery

Chronic Limb Ischemia



- Etiology
  - **Atherosclerosis**
  - **Repeated embolic insult**
    - From proximal aneurysm or other luminal defect
    - Valve vegetations/endocarditis
    - Untreated hypercoaguable state
      - Lupus anticoagulant

Chronic Limb Ischemia

- Classification
  - **Rutherf**

Rutherford classification for chronic limb isc

Grade	Category	Clinical description
0	0	Asymptomatic—no h
	1	Mild claudication
I	2	Moderate claudicatio
	3	Severe claudication
II	4	Ischemic rest pain
III	5	Minor tissue loss—n
	6	Major tissue loss—ex

Abbreviations: AP, ankle pressure; PVR, pulse vo

Fontaine classification

Grade	Symptoms
Stage I	Asymptomatic, incomplete blood vessel obstruction
Stage II	Mild claudication pain in limb
Stage IIA	Claudication at a distance > 200 m
Stage IIB	Claudication at a distance < 200 m
Stage III	Rest pain, mostly in the feet
Stage IV	Necrosis and/or gangrene of the limb

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Chronic Limb Ischemia

- Critical Limb Ischemia (CLI)
  - Rest pain or tissue loss (Rutherford grade 2 or 3)
    - 95% of pts with rest pain will lose limb within 1 yr if not revascularized
    - Can be managed in OP setting commonly
      - PVL -> Angio/int -> ?OR

Acute Limb Ischemia

- Incidence – 1-2 per 10k per year
  - 12% of adult population has PAD
- Risk factors – smoking, HTN, HLD, DM, CKD, CAD, a fib
- Prognosis – 1 yr limb loss up to 40%, 1 yr mortality rate 20+%

Does Acute vs Chronic Matter?

- Outcomes – Baril et al 2013
  - 323 urgent bypasses for ALI vs 5000+ for CLTI
    - 1 yr amp rate 22% vs 10%
    - 1 yr mortality rate 21% vs 13%
    - In hospital MAE 20% vs 12%

ABSTRACTS FROM THE 2013 SOCIETY FOR CLINICAL VASCULAR SURGERY ANNUAL SYMPOSIUM | VOLUME 57, ISSUE 1, P296-297, JANUARY 2013

Outcomes of Lower Extremity Bypass Performed for Acute Limb Ischemia

Donald T. Baril, MD • Virendra I. Patel, MD • Dejah R. Judelson, MD • ... Nathanael Hevelone, MPH • Jack L. Cronenwett, MD • Andres Schanzer, MD • Show all authors

Acute Limb Ischemia

- Presentation – “6 P’s”
  - Pulselessness: immediate
  - Pallor: 1-5 minutes
  - Pain: 5-30 minutes
  - Paresthesia: 1-3 hrs
  - Paralysis: 4-6 hrs
  - Poikilothermia: 6-12 hrs

Acute Limb Ischemia

- Important initial questions:
  - How salvageable is the extremity?
  - How much time do we have?
  - What treatment options?

Acute Limb Ischemia

- Workup
  - H&P, pulse exam, CW doppler signals
  - If absent/asymmetric fem pulse get CTA a/p with BILAT runoff if can tolerate contrast
    - AI duplex good alternative
  - ABI +/- LE duplex helpful if can be done quickly
  - BMP/CBC/INR/T&S/EKG

Acute Limb Ischemia

- Rutherford ALI Classification

Rutherford classification for acute limb ischemia

Category	Description/Prognosis	Findings		Doppler signal	
		Sensory loss	Muscle weakness	Arterial	Venous
I. Viable	Not immediately threatened	None	None	Audible	Audible
II. Threatened					
a. Marginally	Salvageable if promptly treated	Minimal (toes) or none	None	Inaudible	Audible
b. Immediately	Salvageable with immediate revascularization	More than toes, associated rest pain	Mild, moderate	Inaudible	Audible
III. Irreversible	Major tissue loss or permanent nerve damage inevitable	Profound, anesthetic	Profound, paralysis	Inaudible	Inaudible

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Acute Limb Ischemia

- Etiology
  - In situ thrombosis
    - Common - Graft/stent thrombosis, plaque rupture, PAD progression
    - Rare – aneurysm thrombosis (esp PopA), acute dissection, trauma, CHF/low flow state, hypercoag, iatrogenic
    - Usually R-IIa, cool/cyanotic, e/o contralateral ASO

Acute Limb Ischemia

- Etiology
  - Embolic
    - Common – A fib, atheroembolism, valvular disease/endocarditis, hypercoaguable states
    - Rare – MI/LV aneurysm, fat/air/tumor emboli
    - Usually R-IIb, cold/pale/demarcated, + contralat pulse

Acute Limb Ischemia

- Initial Management
  - Anticoagulate and resuscitate
  - Treat other acute issues (MI, Afib with RVR, abx, K+ etc)
  - Consult vascular surgery

Acute Limb Ischemia

- Subsequent mgmt depends on degree of ischemia
  - R-I can be initially managed medically
    - Surgical intervention not always required
  - R-IIa and IIb have salvageable extremities and need urgent revascularization – goal within 3-6 hrs
  - R-III represents non-salvageable limb that will require amputation
    - Typically can be done non emergently

Acute Limb Ischemia

- R-IIa – marginally threatened
  - Pts safe for trial of endo therapy and CDT
    - Angiogram, traverse occlusion, place lytic catheter/start infusion and send to ICU, repeat angio ~24 hrs later
      - Allows identification and treatment of “culprit lesion” in in-situ thrombosis
      - **Cardiac emboli are generally low in fibrin and thus poorly responsive to thrombolytic therapy

Catheter Directed Thrombolysis

- Rochester Trial ‘94
  - CDT with UK vs OS for ALI <7days
  - CDT with fewer MIs and better 30d AFS
- STILE Trial ‘94
  - CDT with UK or TPA vs OS for ALI <14d and CLI
  - CDT had better 6 mo AFS and shorter LOS
  - Beyond 14d CDT not very effective

Catheter Directed Thrombolysis

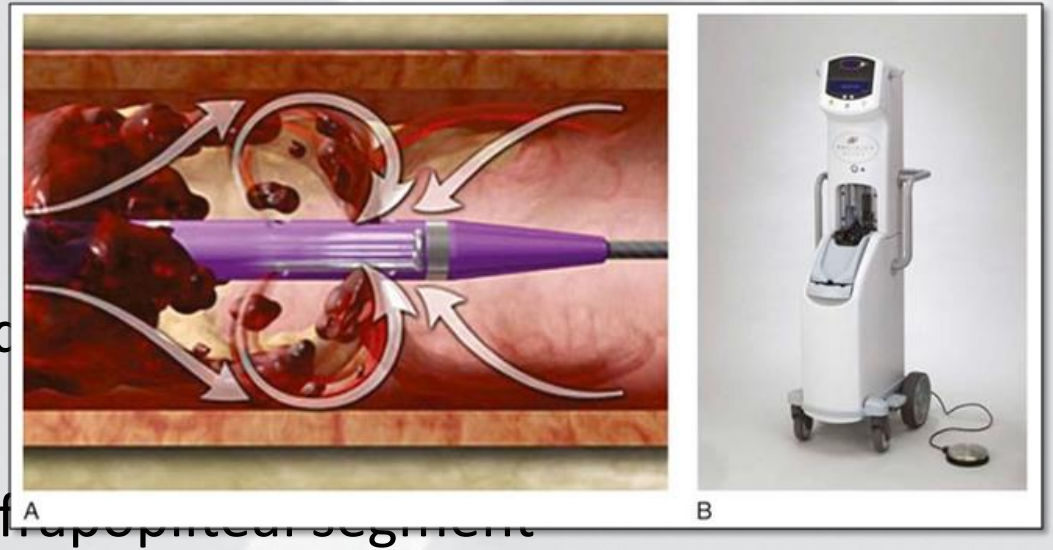
- TOPAS Trial ‘98
  - CDT with UK vs OS for ALI <14d
  - Similar AFS and overall survival at 1yr
- NATALI Database 2004
  - 1,133 ALI Pts with CDT
  - 75% 30d AFS
  - 12% 30d mortality

Acute Limb Ischemia

- R-IIb – immediately threatened
  - Need immediate revasc, no time for CDT
  - Traditionally emergent surgical thrombo-embolectomy via one or more incisions
  - Four compartment fasciotomies
  - Perc mechanical thrombectomy gaining popularity

Acute Limb Ischemia

- Outcomes – Leung et al, J endovasc therapy 2015
  - 283 pts with ALI treated with rheolytic thrombectomy +/- adjuvant CDT
    - 35% were R-IIb ALI
    - 83% technical success
    - 50% did not require ac
    - 1yr AFS 81%
    - Outcomes better in inf



Acute Limb Ischemia

- Outcomes – Baril et al 2014
  - Between ‘98 and ‘09 endo Tx of ALI increased from 15 to 33%
  - 1 yr amp rates decreased 15% to 11%

Perc Mechanical Thrombectomy

- Jarosinski et al JVS 2024
  - No difference in amp or death
    - 10.6%
  - PMT a/w shorter LOS
  - PMT a/w 2x more reintervention (~80% salvaged endo)
    - No difference in tibial subgroup


Percutaneous thrombectomy for acute limb ischemia is associated with equivalent limb and mortality outcomes compared with open thrombectomy

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JVS Journal of Vascular Surgery SVS Society for Vascular Surgery

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Summary

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- Acute on chronic limb ischemia is rarely a surgical emergency
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Questions

CHECK YOUR CME