

Acute Limb Ischemia

Vascular Surgery service

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Acute Limb Ischemia (ALI)

- Sudden reduction in perfusion that threatens extremity viability
 - Embolism vs thrombosis
- 1.7/100,000 per year
- Mortality ranges 15%-20%
- Morbidity
 - Major bleeding: 10%-15%
 - Amputation: up to 25%
 - Fasciotomies: 5%-25%
 - Renal failure: up to 20%
- *Note: advances in techniques have lowered the incidence of amputations but have not impacted mortality*

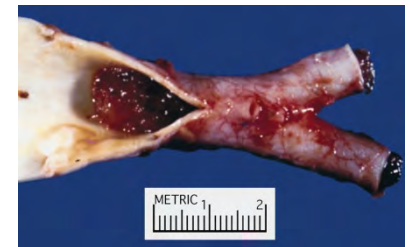
ALI: Etiology

■ Embolism

- Cardiac origin
 - Atrial Fibrillation (2/3rds of cases)
 - Prosthetic cardiac valves
 - Atrial myxomas
 - Cardiac vegetations
 - Myocardial infarct
- Non cardiac origin
 - Atherosclerotic unstable plaques
 - Aneurysms
 - Foreign bodies
 - Tumors
 - Paradoxical embolus
 - Unidentified (attributed to hypercoagulable states)

■ Thrombosis

- Native artery vs bypass
- Hypovolemia, low flow states, shock
- Hypercoagulability
- Malignancy
- Vasoconstrictive, recreational drugs



ALI: Clinical presentation

- Five P's
 - **Pain**-not well localized and unaffected by gravity
 - **Pulselessness**- suggestive but not diagnostic
 - ABI, doppler flow signaling
 - **Pallor/ Poikilothermia**- specially compared to contralateral limb
 - **Paresthesia**- >50% of patients
 - **Paralysis**- poor prognostic sign



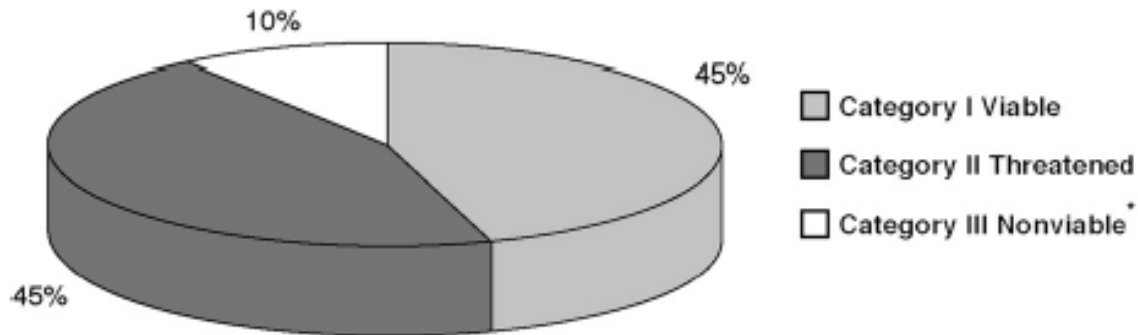


ALI: Clinical classification

Category	Prognosis	Sensory loss	Muscle weakness	Doppler Arterial signals	Doppler Venous signals
I. VIABLE	Not immediately threatenened	none	None	Audible	Audible
IIa. MARGINALLY THREATENED	Salvageable If treated promptly	Minimal (toes)	None	Often inaudible	Audible
IIb. IMMEDIATELY THREATENED	Salvageable with immediate revascularization	More than toes, rest pain	Mild to moderate	Usually inaudible	Audible
III. IRREVERSIBLE	Major tissue loss Permanent nerve damage	Profound anesthetic	Paralysis (rigor)	Inaudible	inaudible

ALI: Clinical classification

- Main objective of initial evaluation
 - Establish severity of ALI and limb viability



Etiology of ALI at initial presentation

ALI: Diagnosis and Work up

- Routine labs
 - CBC, chemistry, coagulation parameters, CPK, EKG, TEE
- Imaging
 - Arteriography- mainstay of work up
 - CTA/ MRA- also usefull
 - Duplex- effective noninvasive, fast imaging tool in decision making*
- Note: initial work up should be tailored to clinical condition and medical resources
 - Treatment should not be delayed by investigative studies

ALI



ALI: Treatment

- Early anticoagulation
 - Prevent thrombus propagation and worsening ischemia
- Endovascular procedures (often used in combination)
 - Pharmacologic thrombolysis
 - Catheter directed thrombolysis
 - Urokinase, streptokinase, r-TPA
 - Percutaneous thromboembolectomy
 - Percutaneous aspiration thrombectomy (PAT)
 - Percutaneous mechanical thrombectomy (PMT)



ALI: Treatment

- Open surgical interventions
 - Balloon catheter thromboembolectomy
 - Completion arteriography
 - Bypass procedures
 - Endarterectomy +/- angioplasty
 - Intraoperative thrombolysis
 - +/- fasciotomies
 - Prevent compartment syndrome
 - >6hrs of ischemia

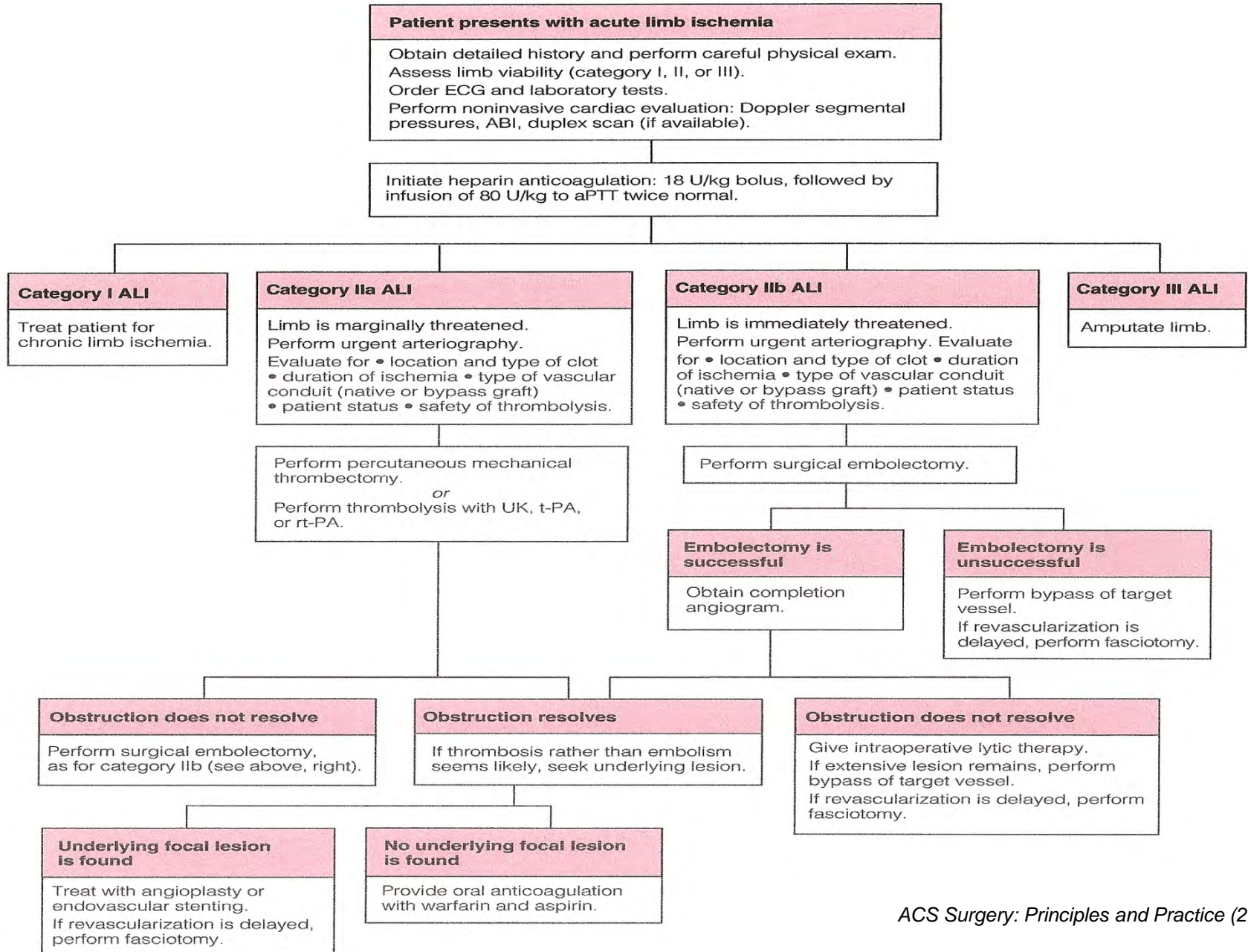
ALI: Treatment

- Surgery vs Catheter directed thrombolysis (CDT)

Table E4. Comparison of catheter-directed thrombolysis and surgical revascularization in treatment of limb ischemia

	Results at	Catheter-Directed Thrombolysis (CDT)			Surgical Revascularization		
		Patients	Limb salvage	Mortality	Patients	Limb salvage	Mortality
Rochester ¹⁷⁸	12 months	57	82%	16%	57	82%	42%
STILE ¹⁷⁴	6 months	246	88.2%	6.5%	141	89.4%	8.5%
TOPAS ¹⁷⁹	12 months	144	82.7%	13.3%	54	81.1%	15.7%

Approach to the Acutely Ischemic Limb



References

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