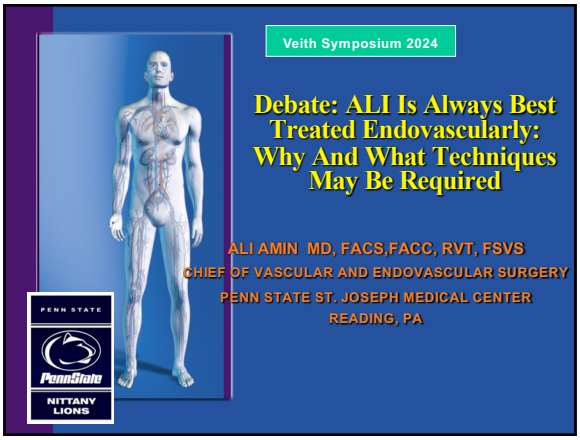

1

- No Conflict

2

Most with some Exceptions

All Patients with Acute Limb Ischemia Should Be Treated Endovascularly First

"Some Patients With ALI Need Open Surgical Techniques"

Dictionary "Some": unspecified number or amount

3

Most Patients with Acute Limb Ischemia Can Be Treated Endovascularly

- Advance Endovascular skills
- Appropriate endovascular Tools/Devices
- Must achieve adequate arterial flow to the foot with improvement of Pain, Numbness/Motor Abn
- Certain cases may need open surgery: Femoral/Brachial emboli from A. Fib, Multi-Segmental Art. Occlusion with an outflow target vessel to the foot

4

Peripheral Arterial Occlusion (PAO)

1. Acute → Acute Limb Ischemia (ALI) < 14 days
2. "Subacute"
3. Chronic > 14 days

Clinical Assessment

Stages of Acute Limb Ischemia

Stage	Description and Prognosis	Findings		Doppler Signal	
		Sensory Loss	Muscle Weakness	Arterial	Venous
I	Limb viable, not immediately threatened	None	None	Audible	Audible
II	Limb threatened				
IIa	Marginally threatened, salvageable if immediately threatened, salvageable with immediate revascularization	Minimal (toes) or none	None	Often inaudible	Audible
IIb		More than toes, associated	Mild or moderate	Usually inaudible	Audible
III	Limb irreversibly damaged, major tissue loss or permanent nerve damage inevitable	Profound, anesthetic	Profound, paralysis (rigor)	Inaudible	Inaudible

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Acute Limb Ischemia (ALI)

- Sudden onset (<14 days) of symptoms
- Embolic vs. Thrombotic (Acute on Chronic PAD)
- High risk of limb loss
- Traditional open operative intervention is associated with increase risk of wound infection and high cardiopulmonary M&M, esp in Elderly, longer hospital stay

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TREATMENT

ACUTE LIMB ISCHEMIA

- Surgery
  Thrombectomy
  Embolectomy
  Bypass
- Arteriogram
  Pecut Endovascular Intervention
  (Thromb/Thrombolytic/PTA/Sent)
- Surgery and IntraOp thrombolytic

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Endo-Vascular Treatment

ACUTE LIMB ISCHEMIA

- CDT (Catheter-Directed Thrombolysis)
- AMT
  (Aspiration Mechanical Thrombectomy)
- PMT
  (PharmacoMechanical Thrombectomy)

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Clinical Investigation

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Rheolytic Pharmacomechanical Thrombectomy for the Management of Acute Limb Ischemia: Results From the PEARL Registry

Daniel A. Leung, MD[1], Lawrence R. Blitz, MD[2], Teresa Nelson, MS[3], Ali Amin, MD, RVT[1], Peter A. Soukas, MD[2], Aravinda Nanjundappa, MD, RVT[4], Mark J. Garcia, MD[1], Robert Lookstein, MD[3], and Eugene J. Simoni, MD[4]

[1]Mid-Ohio Cardiology Consultants, Columbus, Ohio; [2]Department of Radiology Sciences, UCLA Medical Center, Los Angeles, California; [3]Department of Cardiology, Alton Ochsner Medical Foundation, New Orleans, Louisiana; [4]Department of Vascular Medicine, St. Elizabeth's Medical Center, Boston, Massachusetts, USA

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Limb Ischemia

Duration of treatment (N=397)

Time Period	Frequency
</= 6 Hrs	229 (58%)
> 6 Hrs & </= 12 Hrs	17 (4%)
>12 hrs & </= 24 Hrs	72 (18%)
>24 hrs	79 (20%)

58% completed in < 6 hrs
80% completed in < 24 hrs

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PEARL Angiographic Results

by Onset of Symptoms

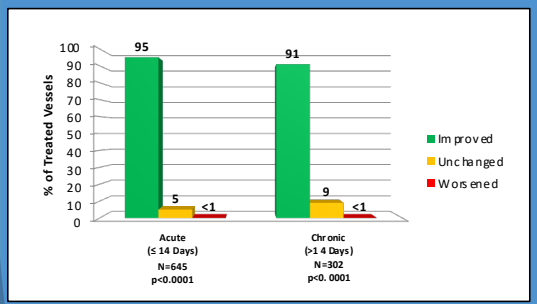

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Table VI. Comparison of current study outcomes with recently published literature of different thrombectomy devices used for acute limb ischemia

Device	Study	No. Patient no.	Patency[a]	30-Day limb Salvage	30-Day mortality	Minimum vessel Diameter[i]
JETi	Current study	59	86.3%	93.2%	1.7%	4 mm
Indigo	Maldonado et al (2024)[15]	119	89.4%[b]	98.2%	3.4%	NR[j]
	Lopez et al (2020)[16]	41	51.7%	97.6%	0.0%	
	Saxon et al (2018)[17]	79	79.5%[c]	97.5%	NR	
AngioJet	Leung et al (2015)[18]	283	83.0%[d]	NR	4.0%	1.5-3 mm[k]
	Kasirajan et al (2001)[19]	86	84.3%[e]	88.4%	9.3%	
Rotarex	Liang et al (2019)[20]	112	44.8%[f]	92.9%	3.6%	3-5 mm[l]
	Heller et al (2017)[21]	147	68.7%[g]	98.0%	0.7%	

NR, Not reported.
[a]Defined as <50% residual thrombus.
[b]Requiring adjunctive thrombolytic therapy and mechanical thrombectomy in 19% and 3% of patients, respectively, in addition to post-thrombectomy treatment of underlying lesion with balloon angioplasty and stenting in 67% and 33% of patients, respectively.
[c]Using the Indigo device as initial therapy and requiring adjunctive balloon angioplasty, stenting, or additional clot removal therapies in 64% of patients.
[d]Requiring adjunctive balloon angioplasty or stenting in 85% of patients.
[e]Requiring adjunctive catheter-directed thrombolysis in 58% of patients.
[f]Defined as <30% residual thrombus.
[g]Defined as recanalization with satisfactory outflow and good capillary filing of the limb, with no measurement of residual stenosis.
[h]After successful recanalization.
[i]As recommended by the manufacturer in the publicly available instructions for use.
[j]No recommendation for minimum vessel diameter by the manufacturer.
[k]1.5 mm when using Solent Dista and 3 mm when using Solent Omni or Solent Proxi.
[l]3 mm when using a 6F catheter and 5 mm when using an 8F catheter.

Chamseddine JVS Nov 2024

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Goal of Treatment

1. Removal of Clot
2. Re-establish Perfusion
3. Minimize Clot Reformation
4. Treatment of the underlying Lesion/Culprit

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Acute Limb Ischemia (ALI)

- Percutaneous Thrombectomy +/- Thrombolysis provides a minimally invasive alternative to restore perfusion to the symptomatic lower extremity with minimal Morbidity & Mortality
- Native Artery
- Bypass Graft

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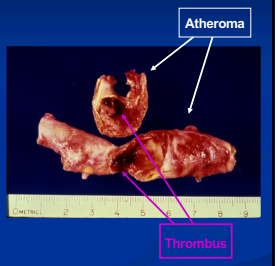
Native Arterial Occlusion

- Combination of a Fresh Thrombus superimposed on chronic atherosclerotic disease (stenosis) segment.
- Removing the thrombus allows visualization of the underlying occult lesion(s) causing the Occlusion.



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Acute Limb Ischemia (ALI)
Occluded Arterial Segment

- Endovascular Intervention allows Visualization, Assessment, and Treatment of the

1) Inflow
2) Occluded Segment
3) Outflow

in a percutaneous fashion without major M & M of a Bypass procedure as well (most likely) avoiding Fasciotomy… reperfusion injury

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Benefits of EVI

- Converting the patient from Acute state to their baseline Chronic state
- Convert an urgent surgical intervention to an elective revascularization
- Remove the thrombotic component of the occlusion
- Lyse thrombi in the distal artery, restoring patency to the outflow arteries
- Re-establish patency of an occluded but non-diseased inflow source for possible subsequent bypass

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Benefits of EVI

- Prevent arterial intimal injury from balloon catheter thrombectomy by avoiding operative thromboembolectomy.
- Reduce the level of amputation in patients in whom complete success can not be achieved
- May reduce development of compartment syndrome and the need for fasciotomy

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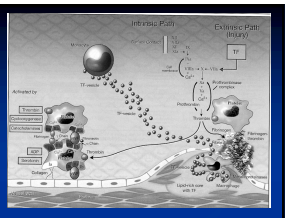
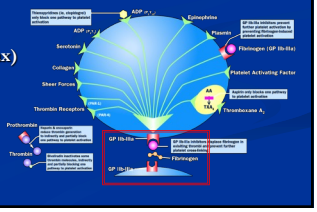
Tool Box

- Antiplatelet Drugs
  1) ASA
  2) Plavix
- 3) IIb/IIIa inhibitor (Cangrelor)
- Anticoagulant
  1) Heparin
  2) Bilvalirudin (Angiomax)





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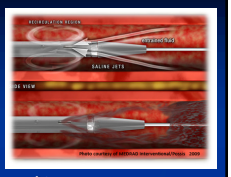
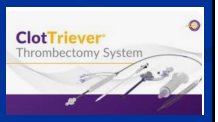
Tool Box

- Thrombolytic Agents
  1) tPA
  2) rPA
- Mechanical Thrombectomy catheter/Aspiration Devices
- Infusion Catheter





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Tool Box (Techniques)

- Contralateral Approach (Inflow, Occluded segment, Outflow)
- 6/7/8 Fr Sheath: perform various type of EVI
- Guidewire Traversal Test (GTT) predicts endoluminal success
- Native Occlusion: .018 St. hydrophilic wire
- Graft Occlusion: .035 hydrophilic wire (Glide W.)

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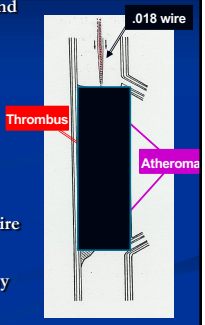
Native Arterial Occlusion

- Can not distinguish between Thrombus and Atheroma "Occluded"
- Atheroma contains the Culprit Lesion (s)
- Key: Pass wire thru the Thrombus and Atheroma without subintimal dissection
- Gently use 0.018 hydrophilic straight tip wire
- Allows using Percutaneous Thrombectomy +/- Thrombolytics



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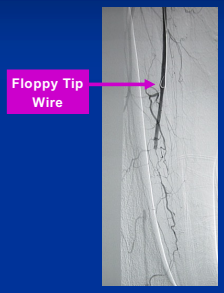
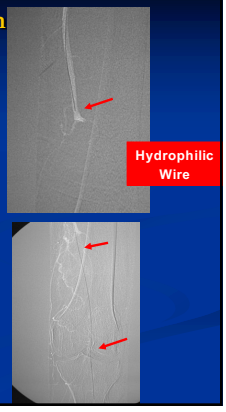
Wire: Native Arterial Occlusion





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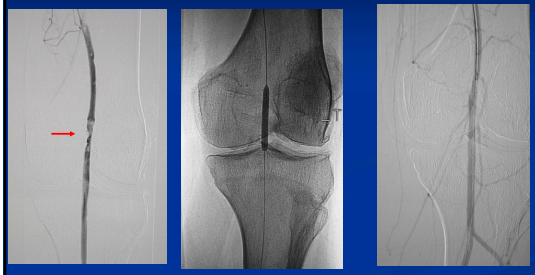
PTA of the Stenosis after Perc. Thrombectomy



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Summary

- Majority of patients with Acute Limb Ischemia can be treated effectively with percutaneous Thrombectomy +/- thrombolysis and endovascular techniques.
- Advance endovascular techniques/experience and appropriate tools are essential to accomplish this goal

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