

Tibial Recoil – Learn How to Recognize and Treat this Serious Obstacle in CLI Patients

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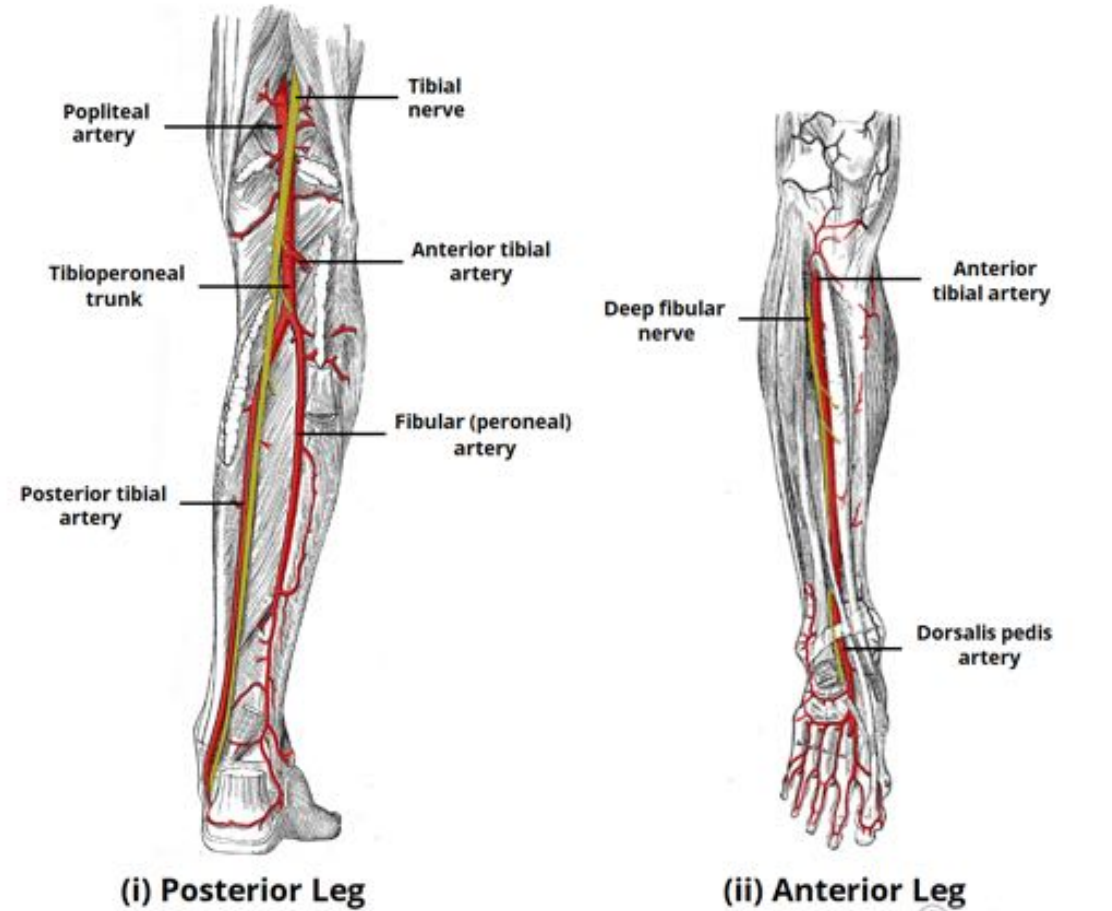
Raleigh, North Carolina - USA

Disclosures

Company	Consultant	Research	Speaking Representative
Abbott Vascular	X	X	X
Asahi Intecc	X		X
Bard	X	X	
Boston Scientific	X	X	
Cardinal	X		
Cardiovascular Systems Inc.	X	X	X
Control Medical	X		X
Cook Medical	X	X	X
CleSys		X	
Daiichi Sankyo	X	X	
Gore	X	X	X
Intact Vascular	X	X	X
Lake Region Medical	X	X	X
Marino Polymer Technologies	X	X	
Medtronic	X	X	X
Mercator Med. Systems	X	X	X
Meril	X		
Penumbra	X	X	X
Philips	X	X	X
Ricorwood Medical	X		
Shockwave Medical	X	X	
Soundbite	X	X	X
Terumo	X		X

Understanding Tibial Anatomy

- Smaller vessel diameters
- Higher propensity of medial calcium
- Often tortuous anatomy



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Recoil

- Recoil is an issue as most physicians, if not immediately recognized, do not take additional pictures allowing time for recoil.
- Previously speculated then confirmed in 2014 but Bauman et. al. data release
- 30 patients, 97% showed 29% reduction in luminal area 15 minutes post angioplasty.

	Total (n=30)	Diabetics (n=15)	Non-Diabetics (n=15)	p
RVD				
ATA, mm	2.60±0.69	2.51±0.68	2.65±0.74	0.95
PTA, mm	2.52±0.73	2.53±0.85	2.51±0.72	0.75
TPT / PA, mm	2.78±0.23	2.77±0.24	2.78±0.25	0.92
MLD at baseline				
ATA, mm	0.40±0.52	0.49±0.58	0.34±0.51	0.92
PTA, mm	0.16±0.30	0.15±0.30	0.17±0.34	0.80
TPT / PA, mm	0.05±0.12	0.02±0.04	0.11±0.21	0.003
MLD post BA				
ATA, mm	2.10±0.53	1.84±0.36	2.26±0.57	0.43
PTA, mm	1.85±0.45	1.63±0.09	2.08±0.56	0.006
TPT / PA, mm	1.98±0.55	1.82±0.54	2.29±0.52	0.83
MLD at 15 minutes				
ATA, mm	1.62±0.43	1.45±0.37	1.73±0.44	0.78
PTA, mm	1.38±0.38	1.11±0.13	1.65±0.36	0.09
TPT / PA, mm	1.33±0.36	1.20±0.34	1.59±0.27	0.56
Elastic recoil at 15 minutes				
ATA, %	27.0±9.8	28.1±10.1	26.4±9.1	0.59
PTA, %	29.0±8.3	35.1±10.6	22.9±7.5	0.02
TPT / PA, %	33.1±5.7	34.2±10.7	30.9±8.8	0.03

Importance of Controlled Plaque Modification





Atherectomy

Current
Therapeutic
Options

Focal Force
Balloons

Shockwave
IVL



Goal is to modify plaque in such a way to resolve the lesion with minimization of recoil, prevention of dissections, ultimately reducing restenosis.

Case

- 50 y/o Male - DM, CKD, HTN, Obesity
- Previous L BKA
- Presents with RLE CLI including : thigh, calf, heel, forefoot, and toes





Retrograde access of the R Anterior Tibial



Case 1

IVUS of the R Anterior Tibial at baseline demonstrated RVD 4.0mm

IVUS at baseline post angioplasty, 15minutes post angioplasty, and 30min post angioplasty.

REFERENCE POINT	BASELINE POST ANGIOPLASTY	Δ 0-15min	15 MIN POST ANGIOPLASTY	Δ 15-30min	30 MIN POST ANGIOPLASTY	Δ 0-30 min
69	3.2 x 4.1 A - 11mm ²	2.4mm ²	3.1 x 3.6 A – 8.6mm ²	1.9mm ²	2.7 x 3.2 A – 6.7mm ²	4.3mm² 39.1%
67	2.8 x 3.2 A - 7.5mm ²	0.5mm ²	2.6 x 3.4 A – 7.0mm ²	0.3mm ²	2.7 x 3.1 A – 6.7mm ²	0.8mm² 10.7%
65	3.0 x 3.3 A - 8.0mm ²	0.5mm ²	2.3 x 3.7 A – 7.5mm ²	0.1mm ²	2.6 x 3.4 A – 7.4mm ²	0.6mm² 7.5%
63	2.6 x 4.2 A – 9.3mm ²	0.4mm ²	2.9 x 3.8 A – 8.9mm ²	1.0mm ²	2.9 x 3.4 A – 7.9mm ²	1.4mm² 15.1%
61	3.3 x 3.9 A – 9.7mm ²	0.4mm ²	3.0 x 4.0 A – 9.3mm ²	0.6mm ²	3.1 x 3.5 A – 8.7 mm ²	1.0mm² 10.3%
59	3.0 x 3.5 A – 8.6mm ²	0.4mm ²	3.0 x 3.6 A – 8.2mm ²	0.7mm ²	3.0 x 3.2 A – 7.5 mm ²	1.1mm² 12.8%
57	3.0 x 4.6 A – 11.6mm ²	0.5mm ²	3.5 x 4.1 A – 11.1mm ²	0.2mm ²	3.3 x 4.0 A – 10.9mm ²	0.7mm² 6.0%

Case 2

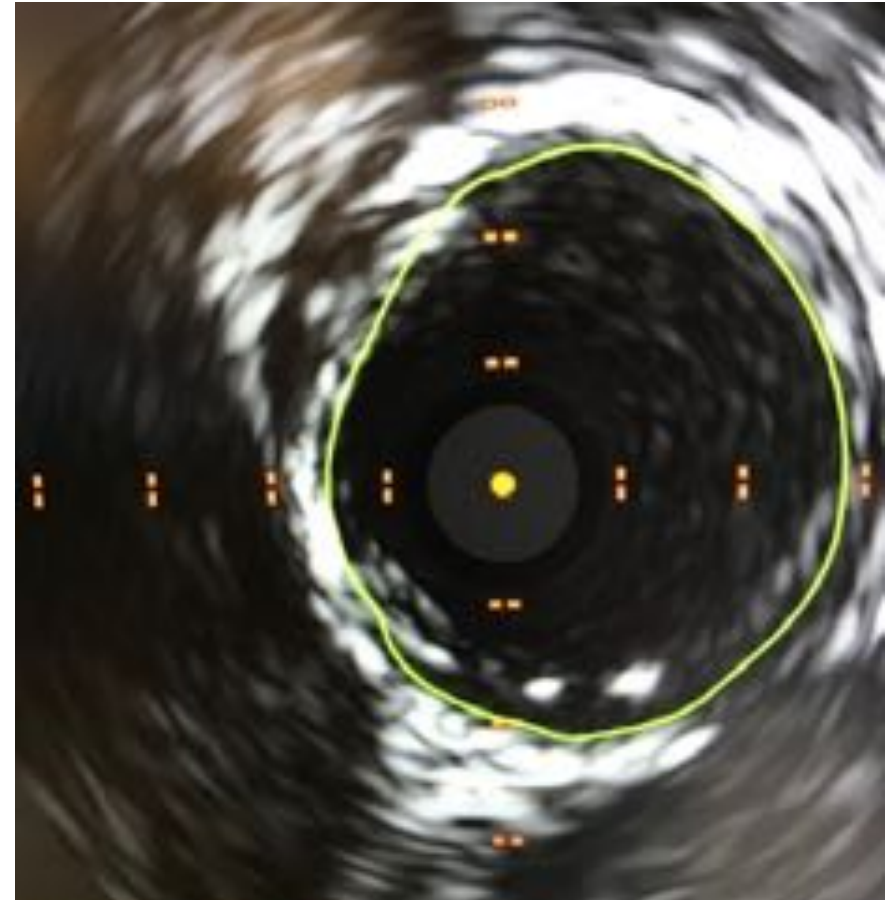
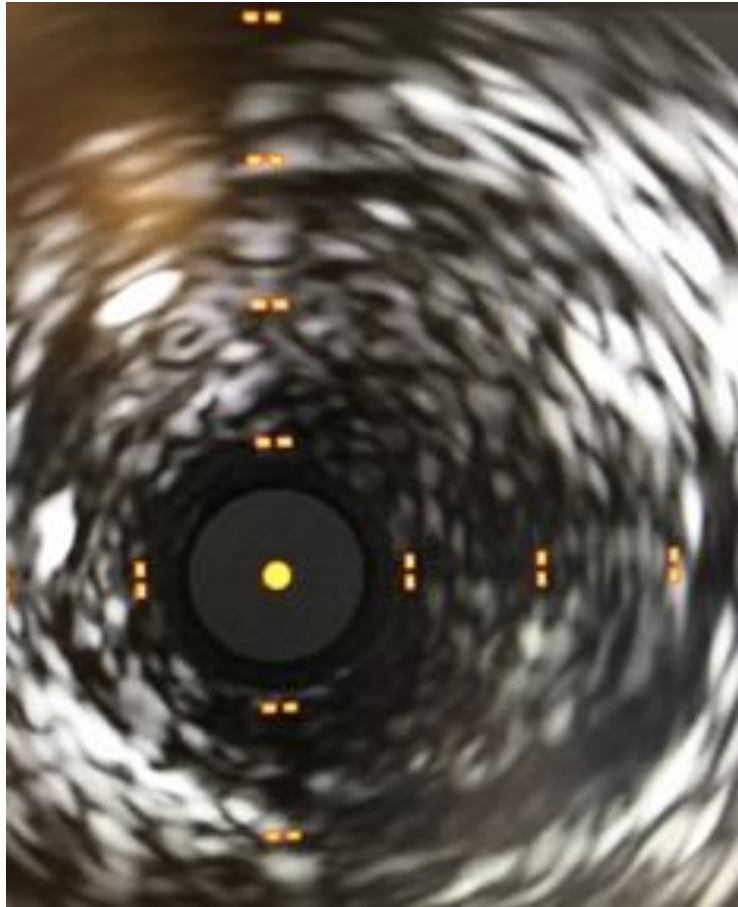
- 76 y/o male - DM, HLD, HTN
- Presents with Rutherford 4 Claudication with rest pain.

Case 2



Shockwave S4 IVL, Heterogeneous Morphology TPT

Case 2



Conclusion

- Recoil continues to impede on the success of revascularization particularly in tibial vessels
- Personalization of care along with device selection may aid in reduction of recoil
- Don't neglect other factors.... Restenosis is also an important failure mechanism and biologic delivery may be aided with adequate vessel preparation.