

Pneumatic Arterial Compression Pumps for Severe PAD

Patient Examples from my Wound Practice

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Disclosures

- None

I am here today because my patients have asked that I participate.

They want others to be able to have the same opportunity to use the high pressure pneumatic arterial compression “pumps” they have had.

Patient 1

- 97 year old with severe PAD
- He presented with wet gangrene 5th toe
- He had rest pain
- He was so uncomfortable that he constantly shuffled his feet, sleeping in a chair at night, describing pain as 10/10

Past Medical History

- Smoked 1 PPD for 10 years, quit 1937
- CABG 2009
- Otherwise remarkably healthy
- Mentally very alert

- Wet gangrene
 - Right 5th toe
- Amputation risk about 50%



Wet gangrene: dead tissue with infection

Non-invasive Vascular Studies

	Right (mmHg)	Index	Left (mmHg)	Index
Brachial	111		118	
Ankle/PT	45	0.38	75	0.64
Ankle/DP	40	0.34	77	.065
1 st toe/digit	0	Could not detect	45	0.38
2 nd toe/digit	39	0.33		

Index should be close to 1

Patient 1

- He declined further work-up for his arterial disease
 - He was willing to wear the “pumps,” which he did 8 hr/day
 - His rest pain was tolerable when he was wearing the pumps
 - Within 6 weeks, his rest pain was completely resolved
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- He died 3 months later, pain-free and all toes attached



Patient 2

- 94 year old female with severe PAD and severe rest pain
- On exam full thickness tissue necrosis on lateral aspect of left foot
[Wound down to bone]

Past Medical History

- Non-diabetic
- HTN for years
- Former smoker many years ago
- Mentally fairly alert and oriented



Buerger's Test



Paleness with elevation demonstrates severity of artery disease:
Artery flow cannot overcome gravity

Non-invasive Vascular Studies

	Right (mmHg)	Index	Left (mmHg)	Index
Brachial	181		191	
Upper thigh	162	0.85	136	0.71
Lower thigh	160	0.84	119	0.62
Calf	162	0.85	117	0.61
Ankle/PT	143	0.75	104	0.54
Ankle/DP	120	0.63	95	0.5
1 st toe digit	41	0.21	37	0.19

Patient 2

- Started pumps (and antibiotics, wound care)
- Angiography demonstrated diffuse small vessel disease—not amenable to intervention
- 7 months later, her rest pain has resolved and she has completely healed her wound
- Most important---she still has her leg



Patient 2

- By her vascular status, if she required an amputation, she would have ended up with an **Above Knee Amputation**

Patient 3

- 80 year old presented with right heel ulcer
- He had a left below knee amputation about 10 years prior
- We call the remaining leg the “Golden limb”

Past Medical History

- Diabetic for greater than 50 years
- Multiple other medical problems
- He was scheduled for treatment of arm sarcoma
 - Surgical excision
 - Radiation and Chemotherapy

Patient 3

- On exam his right foot was cool to the touch
 - He had an ulcer right lateral heel 1.5 cm
 - He had a very positive Berger's test
 - Skin was cool from the mid-calf down to toes
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- Due to impending arm sarcoma treatment, he deferred further vascular work-up



Patient 3

- He started pneumatic arterial pumps
- He had surgery, radiation and chemo for arm sarcoma
- Heel Ulcer healed by 6 months



Patient 3

- I saw him 11 months after starting pumps
- Warm toes with less than 2 second capillary refill
- He is thrilled!

Patient 4

- 81 year old presented with right lateral foot wound, dry gangrene
- Rest pain--he constantly shifted in his wheelchair due to pain

Past Medical History

- Former smoker, but family still smokes
- Diabetic for many years
- Multiple other current health issues
 - Chronic renal insufficiency
 - Congestive heart failure
 - Recent pneumonia



Non-invasive Vascular Studies

	Right (mmHg)	Index	Left (mmHg)	Index
Brachial	193		202	
Ankle/PT	107	0.53	255	
Ankle/DP	70	0.35	144	0.71
1 st Toe/Digit	28	0.14	77	0.38

Patient not a candidate for intervention

3 months later

- Still wearing the pumps
- Pain is much improved



In Summary

What I have seen

- Pumps offer an option for patients without vascular intervention alternatives
 - Even as an adjunct with intervention
- Pump use improves rest pain in as little as 4-6 weeks
- Wounds heal

- Pumps have been invaluable for over 100 patients over the past 3 years
 - 2 amputations
 - 20 deaths, but were improving
 - 25 lost to my follow up
 - All others healed or are healing