Patient experience with stair climbing for peripheral artery disease

In the present letter, I have recounted my experience using stair climbing to address critical limb ischemia (CLI).

Tests in November 2015 (pulse volume recording and segmental pressure study) and December 2016 (lower extremity arterial Doppler and duplex ultrasound) yielded a right ankle brachial index (ABI) of 0.55 and multiphasic inflow but absent spectral Doppler signals in my occluded superficial femoral artery's proximal and mid-segments. Walking 50 m caused intense right calf pain, forcing me to stop and rest. However, fasting for 10 hours before walking and stationary recumbent cycling on the days between walks reduced my calf pain and profoundly improved my walking ability.[1]

My lower extremity arterial Doppler and duplex ultrasound studies in December 2018 yielded a right ABI of 0.38, with the same segments occluded. In early 2020, the tips of my right second, third, and fourth toes had become ulcerated and showed no signs of healing for several weeks. The associated intense, incessant pain became the main limitation to my walking. Because cycling placed greater demands on my quadriceps than walking and was helpful in my earlier experiment,[1] I wondered whether the added demand of stair climbing would address my CLI symptoms and, thus, made it the core of my 2-year-long study.[2]

My right resting ABIs plotted vs time, along with a linear regression fit (Fig), showed a 52% ± 10% (standard error of the mean) increase from December 2018 through February 2022, suggesting that stair climbing as therapy for patients with peripheral artery disease might deserve further investigation.

Although I am aware of the limitations of single-patient case studies, as a non-physician, I cannot conduct a multipatient clinical trial. However, I believe value exists in bringing a patient's perspective into peripheral artery disease research. After incorporating stair climbing into my exercise regimen, my toe ulcerations healed, my foot pain resolved, and my average daily walking distance increased from 2 km to 8 km. Because walking and hiking have been lifelong passions for me, this renewed ability has greatly improved my quality of life.

Extensive evidence has shown that supervised walking programs can improve the walking ability of patients with claudication.[3] For patients with CLI symptoms, my experience suggests that adding stair climbing to their exercise regimen could be helpful.

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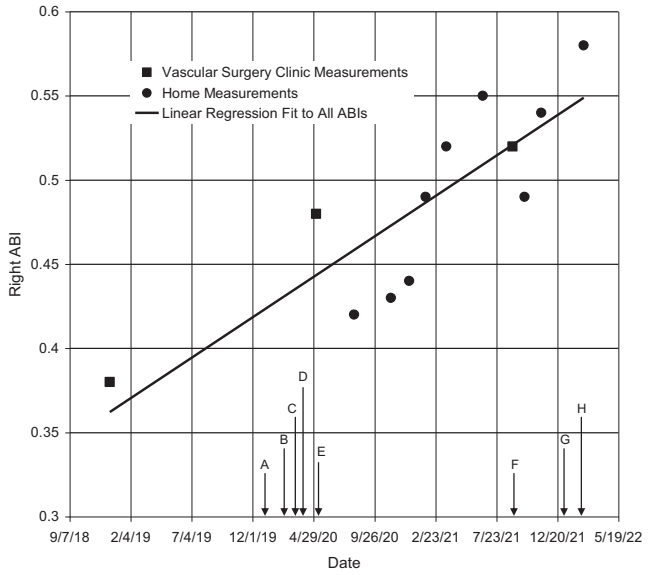

Fig. Right ankle brachial index (ABI) stratified by date from December 2018 through February 2022. Description of events indicated by capital letters pointing to dates on the x-axis: *A,* January 1, 2020: nonhealing ulcerations with intense, incessant pain on tips of second, third, and fourth right toes. *B,* February 18, 2020: 2-year-long stair climbing study began (average ± standard error of the mean daily values for entire study: flights climbed and time required, 30 ± 1 and 12 ± 1 minutes, respectively; distance walked and time required, 3.9 ± 0.1 km and 1.0 ± 0.1 hours, respectively; energy used in stationary recumbent cycling and time required, 34 ± 2 MET-minutes and 18 ± 1 minutes, respectively). *C,* March 15, 2020: toe ulcerations showed first signs of improvement, with diminished pain. *D,* March 31, 2020: at my telehealth vascular surgery appointment, the sores on the toes were no longer open and oozing, the nailbeds were no longer blackened, and my pain had diminished further. Cilostazol and metoprolol were added to my continuing medications of rosuvastatin, propranolol, magnesium, and vitamins B12 and D3. *E,* May 5, 2020: the vascular surgeon's notes described my skin condition as "very small healing wounds to some of the nailbeds of the toes on the right foot." *F,* August 31, 2021: the vascular surgeon's notes read "prior digital wounds on the right foot have healed. The skin overlying both feet appears healthy." *G,* January 1, 2022: no more pain in the toes. *H,* February 17, 2022: stair climbing study has ended. I have not required any revascularizations.