ABSTRACT

Rapid Intermittent Compression Increases Skin Circulation in Chronically Ischemic Legs with Infra-popliteal Arterial Obstruction

Paul S. van Bemmelen, J. Weiss-Olmanni and J.J. Ricotta
Division of Vascular Surgery, State University of New York, Stony Brook, USA

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Intermittent pneumatic compression (IPC) has been shown, by Duplex Imaging, to increase popliteal artery flow in normal legs and in legs with superficial femoral artery occlusion. The objective of this study was to see if IPC improves distal circulation in legs with severe infra-popliteal disease.

Sixteen chronically ischemic legs with arteriographically demonstrated crural or pedal disease were studied during compression with ArtAssist® (ACI Medical, Inc., San Marcos, CA USA) compression-device. This device delivers rapid IPC to the foot and calf. Laser Doppler Flowetry Flux was measured continuously at the dorsal aspect of the distal forefoot. The findings were compared to those in thirteen normal controls of similar age.

In ischemic legs, the spontaneous changes in skin-flux are minimal: mean resting flux in sitting position was 0.87 ± 0.46 AU (Arbitrary Units). Upon activation of the ArtAssist® compression device the maximum flux increased to 4.55 ± 1.35 AU. The difference was statistically significant ($p < 0.001$). This response was similar to that in normal controls.

Arterial flow augmentation upon ArtAssist® compression is associated with increased skin-flux. The increase in the skin-flux persisted during the entire 15 minute ArtAssist® compression period, which could have therapeutic implications. Further investigation to define the role of intermittent compression for management of chronic arterial disease is warranted.