

IMPROVING POPLITEAL ARTERY BLOOD FLOW WITH INTERMITTENT PNEUMATIC FOOT AND CALF COMPRESSION.

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Currently impulse technology is being investigated with respect to its effect of distal arterial volume flow in patients with symptomatic peripheral vascular disease (PVD). Early reports have shown substantial acute enhancement of arterial calf inflow in response to intermittent pneumatic limb compression (IPLC) either in critical leg ischemia or stable claudication.

The aim of the study was to comparatively evaluate the acute effect of intermittent pneumatic foot (IPFC) vs calf (IPCC) vs combined foot and calf compression (IPFCC), (with a delay between the two regions) on the popliteal artery (PA) hemodynamics in normal subjects and patient with stable claudication (Fontaine II), using color flow duplex imaging (CFDI) (HP Sonos 2500). For this purpose 25 limbs of twenty normal subjects (age range 21 to 74 years) and 31 limbs of twenty-five arteriopathies (age range 56-74 years) were examined in the sitting position with or without IPLC (ArtAssist® model AA-1000, ACI Medical, Inc., San Marcos, CA, USA).

PA resting flow in the normal subjects increased by a mean of 98.8% (from 52.4 to 104 ml/min) on application IPFC ($p<0.001$), 188% (from 55 to 158 ml/min) on IPCC action ($p<0.001$), and 274% (from 53 to 198 ml/min) on application of IPFCC ($p<0.001$). PA resting flow in patients with PVD increased by a mean of 58% (from 86 to 135 ml/min) on application of IPFC ($p<0.001$), and 174% (from 82 to 255 ml/min) on application of IPFCC ($p<0.001$). Analysis of all flow velocity parameters (mean, peak systolic [PSV] and end diastolic [EDV] velocities, pulsatility index [PI]) on both groups is also provided.

In conclusion IPFCC is the most effective means of acutely augmenting PA volume flow in normals and arteriopathies. The huge elevation of EDV and decrease in PI indicate that peripheral vasodilation might be a central mechanism in this impulse related flow augmentation.